=> file reg

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STRUCTURE FILE UPDATES: 13 MAY 2004 HIGHEST RN 681515-11-7 DICTIONARY FILE UPDATES: 13 MAY 2004 HIGHEST RN 681515-11-7

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

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Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at: http://www.cas.org/ONLINE/DBSS/registryss.html

=> file caplus

FILE 'CAPLUS' ENTERED AT 09:52:13 ON 14 MAY 2004
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FILE COVERS 1907 - 14 May 2004 VOL 140 ISS 21 FILE LAST UPDATED: 13 May 2004 (20040513/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que

L1 SCR 2043 L3 STR

3

```
Cb @8
                                                  Hy @12
                                                        G1 21
               Cb
                                   Cb√ Cb√ Cb
Cb√ Cb
                                   @9 10 11
@1 2
            @3
               Сb
                7
Cp~O~Cp~O~Cp
                     Cb√ Hy√ Cb
                   Cb√hy- -..
@18 19 20
@13 14 15 16 17
VAR G1=13/18/12/9/8/3/1
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT IS PCY AT
GGCAT IS PCY AT
GGCAT IS PCY AT
GGCAT IS MCY AT 9
GGCAT IS PCY AT 10
GGCAT IS MCY AT 11
GGCAT IS PCY AT 12
GGCAT IS SAT AT 15
GGCAT IS MCY AT 18
GGCAT IS PCY AT 19
GGCAT IS MCY AT 20
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS M2 O AT 12
GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 21
STEREO ATTRIBUTES: NONE
               STR
L5
          Cy @6
 NH
                            Cb√Cb√Cb
                  Cb√Cb
                  @7 @8
                             @9 10 @11
 G1 2
 NH
 5
Cb~-0~-Cb~Cb~Cb~-0~-Cb
@17 15 12 13 14 16 @18
```

NODE ATTRIBUTES:

VAR G1=6/7-4 8-5/9-4 11-5/17-5 18-4

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 16

## STEREO ATTRIBUTES: NONE

L7	9636	SEA FILE=REGISTRY SSS FUL L5 AND L3 AND L1
L8	6215	SEA FILE=CAPLUS ABB=ON PLU=ON L7
L23	3475	SEA FILE=CAPLUS ABB=ON PLU=ON L8(L)(PREP OR IMF OR SPN)/RL
L24	1801	SEA FILE=CAPLUS ABB=ON PLU=ON L23 AND (?HYDROXYAMIDE? OR
		POLYBENZO? OR POLYAMIDES? OR HEAT-RESIST? OR PELECTRIC? OR

CIRCUIT?)

L28 85 SEA FILE=CAPLUS ABB=ON PLU=ON L24 AND ?AMIDES? AND POLYBENZO?

AND (PRODUC? OR PREP? OR MANUFACT? OR FABRICA? OR SYNTHESIZ?)

L30 42 SEA FILE=CAPLUS ABB=ON PLU=ON L28 AND ?ELECTRIC?

## => d ti 1-42

- L30 ANSWER 1 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide dielectric compositions, their coating varnishes, their porous electric insulator films with good elasticity and heat and water resistance, and semiconductor devices having them
- L30 ANSWER 2 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant dielectric films having extremely low moisture absorption and polyamide varnishes therefor
- L30 ANSWER 3 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polymer compositions with excellent resistance to oxidative decomposition and organic electroluminescent elements using them as insulating layers
- L30 ANSWER 4 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant insulator films with uniform fine cells and low dielectric constant, polyamide compositions therefor, and semiconductor devices therewith
- L30 ANSWER 5 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Insulation film materials, varnishes containing them, polyoxazole-based microporous films with low moisture absorption manufactured from them, and semiconductor devices using them

- L30 ANSWER 6 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Manufacture of organic insulating films with good heat stability and low water absorption and of their materials
- L30 ANSWER 7 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN Manufacture of poly(o-hydroxyamides) and polybenzoxazoles as dielectrics
- L30 ANSWER 8 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
  TI Polybenzoxazole dielectrics with self-generated pores
  and o-hydroxyamide monomers for manufacture of these
  porous dielectrics
- L30 ANSWER 9 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Materials and coating varnishes for polybenzoxazole-based electrically insulating films and semiconductor devices
- L30 ANSWER 10 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polybenzoxazole-based electrically insulating materials, their varnish, heat-resistant porous insulator films, and semiconductor devices having them
- L30 ANSWER 11 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide compositions, their varnishes, and polybenzoxazole dielectric films manufactured from the varnishes for semiconductor devices
- L30 ANSWER 12 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide-based varnish compositions for insulating films and semiconductor devices using them
- L30 ANSWER 13 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Porous polybenzoxazole films having extremely low permittivity, their preparation, and their use in semiconductor devices
- L30 ANSWER 14 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant polybenzoxazole precursors with excellent moldability, polybenzoxazoles, and dielectric materials and semiconductor devices using them
- L30 ANSWER 15 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Electrically insulating coating varnishes, and electric insulator films and semiconductor devices using them
- L30 ANSWER 16 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Storage-stable materials and coating varnishes for electrically insulating films and semiconductor devices
- L30 ANSWER 17 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI New poly(o-hydroxyamides) for use in the production of polybenzoxazoles for use in microelectronics

- L30 ANSWER 18 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Electrically insulating films, materials and coating varnishes for them, and semiconductor devices
- L30 ANSWER 19 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI High-temperature-resistant deep-UV-sensitive photoresist composition for forming dielectric or buffer layer in microelectronics
- L30 ANSWER 20 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI High-temperature-resistant photoresist composition for forming dielectric or buffer layer in microelectronics
- ANSWER 21 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

  Polybenzoxazole precursors, their condensed crosslinked polybenzoxazoles, insulating films, and semiconductor devices
- L30 ANSWER 22 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
  TI Polybenzoxazole precursors and their condensate organic insulating films with good heat resistance
- L30 ANSWER 23 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Composition and process for the **production** of a porous layer on substrates using the composition
- ANSWER 24 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

  TI Polyhydroxyamides for polyoxazole coating materials for electronic components
- L30 ANSWER 25 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Method for producing a porous polymer coating for electronic devices
- L30 ANSWER 26 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Insulation films for semiconductor devices with good heat and moisture resistance and benzoxazole ring-formable polyamide varnishes for their manufacture
- L30 ANSWER 27 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide-based copolymers for insulator films, their coating varnishes, and porous insulator films thereof
- L30 ANSWER 28 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

  Heat-resistant coating varnishes with low
  dielectric constant containing polybenzoxazole
  precursors and their insulating films with micropores
- L30 ANSWER 29 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

  TI Heat- and water-resistant polyamide compositions and their porous polybenzoxazole electric insulator films
- L30 ANSWER 30 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide compositions and electrically insulating microporous

film obtained from the compositions for electronic devices

- L30 ANSWER 31 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using the same
- L30 ANSWER 32 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Precursor of a heat resistant resin, heat resistant resin, insulating film, and semiconductor device
- L30 ANSWER 33 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polybenzoxazole resins and their precursors with good thermal and electric characteristics and low water absorption
- L30 ANSWER 34 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant resin compositions with improved adhesion with substrates
- L30 ANSWER 35 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant resin or precursor compositions containing photopolymerable compounds for electric insulators
- L30 ANSWER 36 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant branched polymer compositions with low dielectric constant
- L30 ANSWER 37 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant resin precursor compositions and preparation of heat-resistant resins therefrom
- L30 ANSWER 38 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Naphthalene-based polybenzoxazole precursors and heatresistant electrically insulating polybenzoxazoles therefrom
- L30 ANSWER 39 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Heat-resistant phenylquinoxaline copolymers useful as dielectrics
- L30 ANSWER 40 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Copolymers containing polybenzoxazole, polybenzothiazole and polybenzimidazole moieties
- L30 ANSWER 41 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polyamic acids from diaminocarboxamides, diamines, and tetracarboxylic diamhydrides
- L30 ANSWER 42 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Comparative study of the photodegradation of polybenzoxazoles and related model compounds. Stabilization of polybenzoxazoles

=> d ibib abs hitstr ind total 130

L30 ANSWER 1 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:305598 CAPLUS

DOCUMENT NUMBER:

140:322525

TITLE:

Polyamide dielectric compositions, their

coating varnishes, their porous electric

insulator films with good elasticity and heat and water resistance, and semiconductor devices having

them

INVENTOR(S):

PATENT ASSIGNEE(S):

Sumitomo Bakelite Co., Ltd., Japan Jpn. Kokai Tokkyo Koho, 32 pp.

CODEN: JKXXAF

SOURCE: DOCUMENT TYPE:

Patent

Ono, Koji

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE -----JP 2004119080 A2 20040415 JP 2002-278044 20020924 LTTY APPLN. INFO.: JP 2002-278044 20020924 PRIORITY APPLN. INFO.: The compns. contain polymers that are manufactured from (A)

polyamides [NHX (OH) 2NHCOYCO] m [NHX (OH) 2NHCOZCO] n [NHX (OH) 2NHCOC6H5a [CONHX (OH) 2NH] a-1C.tplbond.CC6H5-b(CO)b]c [X = tetravalent group selected from benzenetetrayl, biphenyltetrayl, etc.; Y = divalent group selected from (alkyl)ethynylphenylene, (alkyl)ethynylbiphenylene, (alkyl) ethynylnaphthylene, (alkyl) ethynylsulfonylbiphenylene diphenyleneacetylene, etc.; Z = phenylene, naphthylene, biphenylene, cyclohexylene, etc.; a = 2-5; b = 1-5, c = 1-100; m > 0;  $n \ge 0$ ; m + n= 2-1000; m/(m + n) = 0.05-1] prepared from bisaminophenols and carboxylic acids containing polybasic carboxylic acids (HOCO) aC6H5aC.tplbond.CC6H5-b(CO2H)b (a, b = same as above) and (B) reactive oligomers having functional groups reactive with carboxy, amino, or OH in the polyamides. Thus, 2,2-bis(3-amino-4-

hydroxyphenyl) hexafluoropropane-5-ethynylisophthaloyl dichlorideisophthaloyl dichloride-5-phenylethynylisophthaloyl dichloride-3,5,4'tolanetricarboxylic acid trichloride copolymer was reacted with polypropylene glycol bis(2-aminopropyl) ether, coated on a Si wafer, and heated at 300° then at 400° for decomposing polypropylene units to give a porous polybenzoxazole film showing Tg >450°,

dielec. constant 1.81.

677716-75-5P

RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

moisture absorption 0.2%, elastic modulus 3.0 GPa, and relative

(polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

RN 677716-75-5 CAPLUS

CN 2,7-Biphenylenedicarbonyl dichloride, polymer with α-(2-aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)], 3,3'-diamino[1,1'-biphenyl]-4,4'-diol and 5,5'-(1,2-ethynediyl)bis[1,3-benzenedicarbonyl dichloride] (9CI) (CA INDEX NAME)

CM 1

CRN 677716-74-4 CMF C18 H6 C14 O4

$$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$$

CM 2

CRN 69417-81-8 CMF C14 H6 C12 O2

CM 3

CRN 9046-10-0 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$H_2N-CH_2-CH_2-O$$
  $(C_3H_6)-O$   $CH_2-CH_2-NH_2$ 

2 (D1-Me)

CM 4

CRN 4194-40-5 CMF C12 H12 N2 O2

IC ICM H01B003-30

ICS C08G073-22; H01L021-312; H01L021-768

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

ST hydroxy polyamide polyacetylene porous dielec film; semiconductor device elec insulator polybenzoxazole porosity; polyoxyalkylene polybenzoxazole polyacetylene decompn porous dielec

IT Porous materials

(films; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyamides, processes
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(polyacetylene-, fluorine-containing, OH-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films
with good elasticity and heat and water resistance for semiconductor

devices)
IT Polybenzoxazoles

RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyacetylene-, fluorine-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Fluoropolymers, processes
Polyoxyalkylenes, processes

IT

```
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); PREP (Preparation); PROC (Process)
        (polyacetylene-polyamide-, OH-containing; polyacetylene-
       polybenzoxazole-based porous elec. insulator films
       with good elasticity and heat and water resistance for semiconductor
        devices)
     Polyoxyalkylenes, processes
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PREP (Preparation); PROC (Process)
        (polyacetylene-polyamide-, fluorine-containing, OH-containing;
polyacetylene-
       polybenzoxazole-based porous elec. insulator films
        with good elasticity and heat and water resistance for semiconductor
     Fluoropolymers, processes
ΙT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PREP (Preparation); PROC (Process)
        (polyacetylene-polyamide-polyoxyalkylene-, OH-containing; polyacetylene-
        polybenzoxazole-based porous elec. insulator films
        with good elasticity and heat and water resistance for semiconductor
        devices)
     Polyoxyalkylenes, uses
IT
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyacetylene-polybenzoxazole-, fluorine-containing;
        polyacetylene-polybenzoxazole-based porous elec.
        insulator films with good elasticity and heat and water resistance for
        semiconductor devices)
     Fluoropolymers, uses
ΙT
     Polyoxyalkylenes, uses
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyacetylene-polybenzoxazole-; polyacetylene-
        polybenzoxazole-based porous elec. insulator films
        with good elasticity and heat and water resistance for semiconductor
        devices)
     Electric insulators
TΤ
     Semiconductor devices
         (polyacetylene-polybenzoxazole-based porous elec.
        insulator films with good elasticity and heat and water resistance for
        semiconductor devices)
     Fluoropolymers, uses
IT
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
      (Technical or engineered material use); PREP (Preparation); PROC
      (Process); USES (Uses)
         (polyacetylene-polybenzoxazole-polyoxyalkylene-;
        polyacetylene-polybenzoxazole-based porous elec.
```

insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyamides, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (polyacetylene-polyoxyalkylene-, OH-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyamides, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (polyacetylene-polyoxyalkylene-, fluorine-containing, OH-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polybenzoxazoles

RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyacetylene-polyoxyalkylene-, fluorine-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polybenzoxazoles

RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyacetylene-polyoxyalkylene-; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyacetylenes, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (polyamide-, fluorine-containing, OH-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyacetylenes, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (polyamide-polyoxyalkylene-, OH-containing; polyacetylene-polybenzoxazole-based porous elec. insulator films with good elasticity and heat and water resistance for semiconductor devices)

IT Polyacetylenes, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (polyamide-polyoxyalkylene-, fluorine-containing, OH-containing; polyacetylene-

```
polybenzoxazole-based porous elec. insulator films
       with good elasticity and heat and water resistance for semiconductor
       devices)
    Polvacetylenes, uses
ΙT
    RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
    manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polybenzoxazole-, fluorine-containing; polyacetylene-
       polybenzoxazole-based porous elec. insulator films
       with good elasticity and heat and water resistance for semiconductor
       devices)
IT
     Polyacetylenes, uses
    RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-, fluorine-containing;
        polyacetylene-polybenzoxazole-based porous elec.
        insulator films with good elasticity and heat and water resistance for
        semiconductor devices)
     Polyacetylenes, uses
ΙT
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-; polyacetylene-
        polybenzoxazole-based porous elec. insulator films
        with good elasticity and heat and water resistance for semiconductor
        devices)
     Polyethers, uses
IT
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyester-, reaction products with OH-containing
        polyamides; polyacetylene-polybenzoxazole-based
        porous elec. insulator films with good elasticity and heat
        and water resistance for semiconductor devices)
     Polyesters, uses
IT
     RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
     manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyether-, reaction products with OH-containing
        polyamides; polyacetylene-polybenzoxazole-based
        porous elec. insulator films with good elasticity and heat
        and water resistance for semiconductor devices)
     Films
```

(porous; polyacetylene-polybenzoxazole-based porous

resistance for semiconductor devices)

elec. insulator films with good elasticity and heat and water

<05/14/2004> KOROMA - EIC 1700

IT

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Polyesters, uses
TΤ
    Polyurethanes, uses
    RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial
    manufacture); PEP (Physical, engineering or chemical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (reaction products with OH-containing polyamides;
       polyacetylene-polybenzoxazole-based porous elec.
       insulator films with good elasticity and heat and water resistance for
       semiconductor devices)
    9003-53-6DP, Polystyrene, aminobenzoate-terminated, reaction
IT
    products with OH-containing polyamides 25248-42-4DP,
    Polycaprolactone, sru, polyols, reaction products with OH-containing
    polyamides 677716-71-1P 677716-73-3P 677716-75-5P
    677716-76-6P 677716-77-7DP, reaction products with
    aminobenzoate-terminated polystyrene 677716-78-8P
                                                        677716-79-9P
    RL: CPS (Chemical process); DEV (Device component use); IMF
     (Industrial manufacture); PEP (Physical, engineering or chemical
    process); TEM (Technical or engineered material use); PREP
     (Preparation); PROC (Process); USES (Uses)
        (polyacetylene-polybenzoxazole-based porous elec.
        insulator films with good elasticity and heat and water resistance for
        semiconductor devices)
L30 ANSWER 2 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                       2004:219355 CAPLUS
DOCUMENT NUMBER:
                        140:271939
                        Heat-resistant dielectric
TITLE:
                        films having extremely low moisture absorption and
                        polyamide varnishes therefor
                        Hase, Yoko; Enoki, Naoshi
INVENTOR(S):
                       Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 27 pp.
SOURCE:
                        CODEN: JKXXAF
DOCUMENT TYPE:
                        Patent
LANGUAGE:
                        Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                        APPLICATION NO. DATE
     PATENT NO. KIND DATE
     _____
                                         _____
                    A2 20040318
                                         JP 2002-247625 20020827
     JP 2004087336
                                      JP 2002-247625
                                                          20020827
PRIORITY APPLN. INFO.:
    Solvent-based varnishes containing polyamide [HNX(OR1)(OR2)NHCOY1CO]m[HNX(OR3)
     (OR4)NHCOY2CO]n [m >0; n \ge 0; 2 \le m + n \le 1000; 0.05
     \leq m/(m + n) \leq1; R1-R4 = H, monovalent organic group; X =
     tetravalent bridging group (e.g., benzenetetrayl, biphenyltetrayl, etc.);
     Y1 = (substituted) ethynyl-containing bivalent bridging group (e.g.,
     ethynylphenylene) or biphenylenedicarboxylic acid residue; Y2 = bivalent
     bridging group (e.g., phenylene, naphthalenediyl, cyclohexylene, etc.)]
     and pyrolytic oligomers (e.g., polyoxyalkylene, PMMA, poly(\alpha-
```

methylstyrene), polyesters, etc.) are claimed. The oligomers may show Mn

100-20,000. Crosslinked polybenzoxazole films formed form the varnishes, with pore diameter  $\leq 1~\mu m$  (preferably  $\leq 20~nm$ ) and porosity 5-70% (preferably 5-40%), are also claimed. The films are useful for cover films of clad laminates, solder resists, liquid crystal alignment layers, etc. Thus, a  $\beta$ -butyrolactone-thinned varnish of 0.64 g 3,3'-diamino-4,4'-dihydroxybiphenyl-4-ethynyl-2,6-naphthalenedicarboxylic dichloride copolymer (Mw 25,600) and 0.36 g styrene oligomer (Mn 9600) was applied on a Si wafer and baked at 300° to give a polybenzoxazole film having dielec. constant (1 MHz) 2.10, pore diameter 15 nm, Tg >450°, and moisture absorption 0.2%. 607739-27-5P 672291-30-4P 672291-31-5P

IT 607739-27-5P 6 672291-33-7P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use): PREP (Preparation); USES (Uses)

(cured; heat-stable nanoporous crosslinked polybenzoxazole films prepared from varnishes containing pyrolytic pore formers) 607739-27-5 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-diamino[1,1'-biphenyl]-4,4'-diol (9CI) (CA INDEX NAME)

CM 3

RN

CN

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CM 2

CRN 4194-40-5 CMF C12 H12 N2 O2

CN

RN 672291-30-4 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with

4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 2

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 1

CRN 393543-09-4 CMF C10 H4 Cl2 O2

CM

CRN 2373-98-0 CMF C12 H12 N2 O2

CM 3

CRN 2351-36-2 CMF C12 H6 C12 O2

672291-33-7 CAPLUS

RN 2,7-Biphenylenedicarbonyl dichloride, polymer with 3,3'-diamino[1,1'-CN biphenyl]-4,4'-diol (9CI) (CA INDEX NAME)

CM 1

CRN 69417-81-8

CMF C14 H6 C12 O2

CM 2

CRN 4194-40-5 CMF C12 H12 N2 O2

ICM H01B003-30 ICS C08G069-32; C09D005-25; C09D179-04; C09D179-08; C09D201-00; H01B003-00; H01L021-312

CC 38-3 (Plastics Fabrication and Uses) Section cross-reference(s): 76

st nanoporous polybenzoxaozle film moisture absorption minimized; heat resistant crosslinked polybenzoxazole film nanoporous; pyrolytic oligomer polyamide varnish polybenzoxazole insulator; diaminodihydroxybiphenyl ethynylnaphthalenedicarboxylic acid polybenzoxazole polyamide varnish

IT Heat-resistant materials

(dielec., films; heat-stable nanoporous crosslinked polybenzoxazole films prepared from varnishes containing pyrolytic pore formers)

IT Porous materials

(films, nanoporous, dielec.; heat-stable nanoporous crosslinked polybenzoxazole films prepared from varnishes containing pyrolytic pore formers)

IT Electric insulators

(heat-resistant, films; heat-stable nanoporous crosslinked polybenzoxazole films prepared from varnishes containing pyrolytic pore formers)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (heat-stable nanoporous crosslinked polybenzoxazole films
 prepared from varnishes containing pyrolytic pore formers)

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Polvamides, uses
ΙT
    RL: RCT (Reactant); TEM (Technical or engineered material use); RACT
     (Reactant or reagent); USES (Uses)
        (hydroxy-containing, varnishes; heat-stable nanoporous crosslinked
       polybenzoxazole films prepared from varnishes containing
       pyrolytic pore formers)
     Polvesters, uses
TТ
     Polyoxyalkylenes, uses
     Polyurethanes, uses
     RL: NUU (Other use, unclassified); USES (Uses)
        (oligomeric, pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     Cardo polymers
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxaozles; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     Polyethers, uses
TT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, e; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     Polyethers, uses
IT
     RL: NUU (Other use, unclassified); USES (Uses)
        (polyester-, oligomeric, pore formers; heat-stable nanoporous
        crosslinked polybenzoxazole films prepared from
        varnishes containing pyrolytic pore formers)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyether-, e; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     Polyesters, uses
IT
     RL: NUU (Other use, unclassified); USES (Uses)
        (polyether-, oligomeric, pore formers; heat-stable nanoporous
        crosslinked polybenzoxazole films prepared from
        varnishes containing pyrolytic pore formers)
     Polyoxyalkylenes, uses
ΙT
     RL: NUU (Other use, unclassified); USES (Uses)
         (pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
TТ
     Films
         (porous, nanoporous, dielec.; heat-stable nanoporous
        crosslinked polybenzoxazole films prepared from
        varnishes containing pyrolytic pore formers)
     607739-27-5P 672291-29-1P 672291-30-4P
IΤ
     672291-31-5P 672291-32-6P 672291-33-7P 672291-34-8P
```

```
RL: IMF (Industrial manufacture); TEM (Technical or engineered
    material use); PREP (Preparation); USES (Uses)
        (cured; heat-stable nanoporous crosslinked polybenzoxazole
        films prepared from varnishes containing pyrolytic pore formers)
     608143-83-5P 672291-35-9P 672291-36-0P 672291-37-1P 672291-38-2P
IT
     672308-99-5P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (heat-stable nanoporous crosslinked polybenzoxazole films
        prepared from varnishes containing pyrolytic pore formers)
     9003-53-6P, Polystyrene
IT
     RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP
     (Preparation); USES (Uses)
        (oligomeric, pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
                                            24980-41-4, Polycaprolactone
     9011-14-7, Poly(methyl methacrylate)
тт
     25014-31-7, Poly(\alpha-methylstyrene)
                                        25248-42-4, Polycaprolactone
     RL: NUU (Other use, unclassified); USES (Uses)
        (oligomeric, pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     25322-69-4, Polypropylene glycol
IT
     RL: NUU (Other use, unclassified); USES (Uses)
        (pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
     96-48-0, y-Butyrolactone
IT
     RL: NUU (Other use, unclassified); USES (Uses)
        (solvents; heat-stable nanoporous crosslinked polybenzoxazole
        films prepared from varnishes containing pyrolytic pore formers)
     106392-12-5, Ethylene oxide-propylene oxide block copolymer
IT
     RL: NUU (Other use, unclassified); USES (Uses)
        (triblock, pore formers; heat-stable nanoporous crosslinked
        polybenzoxazole films prepared from varnishes containing
        pyrolytic pore formers)
L30 ANSWER 3 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                         2004:32658 CAPLUS
ACCESSION NUMBER:
                         140:101757
DOCUMENT NUMBER:
                         Polymer compositions with excellent resistance to
TITLE:
                         oxidative decomposition and organic electroluminescent
                         elements using them as insulating layers
                         Arai, Nana; Tomikawa, Masao; Okuda, Ryoji
INVENTOR(S):
                         Toray Industries, Inc., Japan
PATENT ASSIGNEE(S):
                         Jpn. Kokai Tokkyo Koho, 32 pp.
SOURCE:
                         CODEN: JKXXAF
                         Patent
DOCUMENT TYPE:
                         Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
```

PATENT INFORMATION:

AB The compns., preferably containing curing agents with groups CH2OR (R = H, C1-20 alkyl, C4-20 alicyclic group, RbCO; Rb = C1-20 alkyl), give films with thickness 0.05-20.0  $\mu m$  showing thickness reduction rate during UV ozone treatment  $\leq 0.015 \ \mu m/min$  or thickness reduction rate during O plasma treatment  $\leq 0.005 \ \mu m/min$ .

IT 641629-23-4P

CN

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polymer compns. with good oxidative decomposition resistance for  $\tt dielec.\ films$  for organic electroluminescent elements)

RN 641629-23-4 CAPLUS

1,2-Benzenedicarboxylic acid, 4,4'-carbonylbis-, polymer with
1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, 3,5-diaminobenzoic acid,
1,2-ethanediyl bis(2-methyl-2-propenoate), 2-hydroxyethyl
2-methyl-2-propenoate, 3,3'-methylenebis[2-hydroxy-5-methylbenzenemethanol], 4,4'-oxybis[benzenamine], 2,2'(phenylimino)bis[ethanol] and 3-(triethoxysilyl)-1-propanamine (9CI) (CA INDEX NAME)

CM 1

CRN 22247-58-1 CMF C17 H20 O4

$$\begin{array}{c} \text{CH}_2-\text{OH} \\ \text{HO} \\ \text{CH}_2 \\ \text{OH} \\ \text{CH}_2-\text{OH} \end{array}$$

CM 2

CRN 2479-49-4 CMF C17 H10 O9

$$\begin{array}{c|c} & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ &$$

CM 3

CRN 919-30-2 CMF C9 H23 N O3 Si

CM 4

CRN 868-77-9 CMF C6 H10 O3

CM 5

CRN 535-87-5 CMF C7 H8 N2 O2

СМ б

CRN 120-07-0 CMF C10 H15 N O2

$$\begin{array}{c} & \text{Ph} \\ | \\ \text{HO-} \ \text{CH}_2\text{--} \ \text{CH}_2\text{--} \ \text{N--} \ \text{CH}_2\text{--} \ \text{CH}_2\text{--} \ \text{OH} \end{array}$$

CM 7

CRN 101-80-4 CMF C12 H12 N2 O

CM 8

CRN 97-90-5 CMF C10 H14 O4

CM 9

CRN 89-32-7 CMF C10 H2 O6

- ICM C08L079-08 TC ICS C08K005-13; H05B033-14; H05B033-22
- 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related CC Properties)

Section cross-reference(s): 38, 76

- elec insulator polymer oxidative decompn resistance; UV ozone ST resistance polyimide thickness retention; electroluminescent device dielec film plasma treatment
- Aminoplasts IΤ

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)

(Nikalac MX 290, curing agent; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

- Acrylic polymers, uses IT
  - Silsesquioxanes

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

Phenolic resins, uses IT

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (epoxy; polymer compns. with good oxidative decomposition resistance for

dielec. films for organic electroluminescent elements)

Phenolic resins, uses IT

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (novolak, cresol-based, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic

electroluminescent elements)

- Epoxy resins, uses IT RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (phenolic; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)
- Polysiloxanes, uses IT RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-polyether-polyimide-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec.

films for organic electroluminescent elements)

Fluoropolymers, uses тт

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-polyether-polyimide-polysiloxane-, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

Polyimides, uses IT

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-polyether-polysiloxane-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polysiloxanes, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-polyimide-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polyethers, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-polyimide-polysiloxane-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polyimides, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-polysiloxane-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polyethers, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polybenzoxazole-, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polyamides, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-polyimide-polysiloxane-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Polyamides, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyimide-polysiloxane-, fluorine-containing, cured; polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT Dielectric films

Electroluminescent devices

(polymer compns. with good oxidative decomposition resistance for dielec. films for organic electroluminescent elements)

IT 91-04-3, 2,6-Bis(hydroxymethyl)-p-cresol

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(DML-PC, curing agent; polymer compns. with good oxidative decomposition

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resistance for dielec. films for organic electroluminescent
        elements)
TΤ
     9011-05-6, Nikalac MX 270
     RL: RCT (Reactant); TEM (Technical or engineered material use); RACT
     (Reactant or reagent); USES (Uses)
        (Nikalac MX 290, curing agent; polymer compns. with good oxidative
        decomposition resistance for dielec. films for organic
        electroluminescent elements)
IT
     2768-02-7, KBM 1003
     RL: MOA (Modifier or additive use); TEM (Technical or engineered material
     use); USES (Uses)
        (coupling agent; polymer compns. with good oxidative decomposition
        resistance for dielec. films for organic electroluminescent
        elements)
     101-80-4DP, 4,4'-Diaminodiphenyl ether, reaction products with
IT
     acid anhydride and diamine 2420-87-3DP, 3.3',4.4'-
     Biphenyltetracarboxylic dianhydride, reaction products with
     diamines 25035-81-8P, Methacrylic acid-methyl methacrylate-styrene
     copolymer 27029-76-1P, m-Cresol-p-cresol-formaldehyde copolymer
     129197-38-2DP, reaction products with biphenyltetracarboxylic
     dianhydride and diamine 162816-07-1P 223255-30-9DP, reaction
     products with diamines 347147-75-5P 645385-91-7P
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (cured; polymer compns. with good oxidative decomposition resistance for
        dielec. films for organic electroluminescent elements)
     22247-58-1, 2,2'-Methylenebis[6-(hydroxymethyl)-4-methylphenol]
TT
     32449-09-5, 2,6-Bismethoxymethyl-p-cresol 109129-38-6 421546-91-0
     643090-86-2, Nikalac MX 750LM
     RL: RCT (Reactant); TEM (Technical or engineered material use); RACT
     (Reactant or reagent); USES (Uses)
        (curing agent; polymer compns. with good oxidative decomposition resistance
        for dielec. films for organic electroluminescent elements)
     122-04-3, 4-Nitrobenzovl chloride 3867-55-8, Trimellitic chloride
TT
     83558-87-6, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (for monomer preparation; polymer compns. with good oxidative
       decomposition resistance for dielec. films for organic
       electroluminescent elements)
    3584-23-4D, TAZ 104, esters
                                   20546-03-6D, 1,2-Naphthoquinone-2-diazide-5-
ΙT
     sulfonic acid, esters
    RL: CAT (Catalyst use); USES (Uses)
        (photoacid generator; polymer compns. with good oxidative decomposition
       resistance for dielec. films for organic electroluminescent
       elements)
    641629-22-3P 641629-23-4P
IT
    RL: IMF (Industrial manufacture); POF (Polymer in formulation);
    TEM (Technical or engineered material use); PREP (Preparation);
        (polymer compns. with good oxidative decomposition resistance for
       dielec. films for organic electroluminescent elements)
```

L30 ANSWER 4 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:20171 CAPLUS

DOCUMENT NUMBER:

140:95140

TITLE:

Heat-resistant insulator films

with uniform fine cells and low dielectric constant, polyamide compositions therefor, and

semiconductor devices therewith

INVENTOR(S):

Murayama, Kazumoto; Oki, Hiromi; Saito, Hidenori;

Enoki, Naoshi

PATENT ASSIGNEE(S):

Sumitomo Bakelite Co., Ltd., Japan

Jpn. Kokai Tokkyo Koho, 31 pp. CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

SOURCE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

KIND DATE \_\_\_\_\_\_ APPLICATION NO. DATE

20030320

JP 2004006269 PRIORITY APPLN. INFO.:

A2 20040108 JP 2003-78917

JP 2002-79108 A 20020320

GI

$$R-C \equiv C \qquad C \equiv C-R$$

$$\begin{array}{c|c}
CF_3 \\
C \\
CF_3
\end{array} = Q^2$$

The compns. contain polyamides with AB [NHX(OH) 2COY1CO] m (NHZ1NHCOY2CO) n (OZ2OCOY3CO) k units [X = 1,2,4,5- or1,2,3,4-tetravalent benzene, 3,3',4,4'-tetravalent biphenyl, etc.; Y1-Y3 = Q1, Q2, etc. (other Markush included); Z1, Z2 = divalent heat-decomposable group; m > 0; n > 0;  $k \ge 0$ ;  $2 \le m + n + k \le 1000$ ; 0.4 $\leq$  m/(m + n + k)  $\leq$  0.95] including poly(NHZ1NHCOY2CO) and/or poly(OZ2OCOY3CO) structure. Thus, 9,9-bis(4-amino-3hydroxyphenyl)fluorene was polymerized with 4-ethynyl-2,6naphthalenedicarboxylic acid dichloride and 4-aminobenzoate-terminated styrene oligomer to give block polyamide, which was dissolved in NMP, applied on Al-deposited Si wafer, and baked to give porous

IT

CN

polybenzoxazole film showing uniform cell, Tg 450°, and dielec. constant 2.2 at 1 MHz between Al electrode prepared on the film and the Al deposition layer.

640750-13-6P 640750-16-9P 640750-72-7P,

640750-13-69 640750-13-69 640750-13-27,
9,9-Bis (4-amino-3-hydroxyphenyl) fluorene-ED 2003-4,4'-tolane dicarboxylic acid dichloride block copolymer 640750-73-8P,
9,9-Bis (4-amino-3-hydroxyphenyl) fluorene-ED 2003-5-ethynylisophthalic acid dichloride-5-phenylethynyl isophthalic acid dichloride-polypropylene glycol bis (2-aminopropyl) ether block copolymer 641611-57-6P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

RN 640750-13-6 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with ethenylbenzene and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CM 2

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 3

CRN 100-42-5 CMF C8 H8

 $H_2C = CH - Ph$ 

CM 1

CRN 393543-14-1 CMF C16 H8 Cl2 O2

$$\begin{array}{c} O \\ C1-C \\ C-C1 \\ O \end{array}$$

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 3

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 4

CRN 100-42-5 CMF C8 H8  $H_2C = CH - Ph$ 

CM 5

CRN 100-20-9 CMF C8 H4 Cl2 O2

RN 640750-72-7 CAPLUS

Benzoyl chloride, 4,4'-(1,2-ethynediyl)bis-, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and methyloxirane polymer with oxirane bis(2-aminopropyl) ether, block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 2

CRN 16819-44-6 CMF C16 H8 C12 O2

$$c1-c$$

$$0$$

$$c=c$$

$$0$$

$$0$$

CM 3

CRN 65605-36-9

CMF C3 H9 N O . 1/2 (C3 H6 O . C2 H4 O) x

CM 4

CRN 6168-72-5 CMF C3 H9 N O

$$\begin{array}{c} {\rm NH_2} \\ | \\ {\rm H_3C-CH-CH_2-OH} \end{array}$$

CM 5

CRN 9003-11-6

CMF (C3 H6 O . C2 H4 O) x

CCI PMS

CM 6

CRN 75-56-9 CMF C3 H6 O

CM 7

CRN 75-21-8

CMF C2 H4 O

/3

CN

RN 640750-73-8 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha\text{-}(2\text{-aminopropyl}) - \omega\text{-}(2\text{-aminopropoxy}) poly[oxy(methyl-1,2-ethanediyl)], 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], methyloxirane polymer with oxirane bis(2-aminopropyl) ether, and 5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride, block (9CI) (CA INDEX NAME)$ 

CM 1

CRN 393543-14-1 CMF C16 H8 C12 O2

$$c1-c$$

$$c=c-ph$$

$$c-c1$$

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 3

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 4

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$_{\text{Me-CH-CH}_2-\text{O}}^{\text{NH}_2}$$
 (C<sub>3</sub>H<sub>6</sub>) - O  $_{\text{n}}^{\text{NH}_2}$  CH<sub>2</sub> - CH-Me

CM 5

CRN 65605-36-9 CMF C3 H9 N O . 1/2 (C3 H6 O . C2 H4 O) x

CM 6

CRN 6168-72-5 CMF C3 H9 N O



CM S

CRN 75-21-8 CMF C2 H4 O



RN 641611-57-6 CAPLUS
CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with
α-(4-aminobenzoyl)-ω-[(4-aminobenzoyl) oxy]poly[oxy(methyl-1,2-ethanediyl)] and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], block
(9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0

CMF C10 H4 C12 O2

CM 2

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 3

CRN 77450-83-0 CMF (C3 H6 O)n C14 H12 N2 O3 CCI IDS, PMS

$$\begin{array}{c|c} & & & \\ & & \\ & & \\ \end{array}$$

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TC
    TCM H01B003-30
    ICS C08G069-44; C08G073-22; H01L021-312; H01L021-768; H01L021-90
    38-3 (Plastics Fabrication and Uses)
CC
    Section cross-reference(s): 76
    polyamide heat decomposable group porous polybenzoxazole
ST
    dielec film; aminohydroxyphenylfluorene
    ethynylnaphthalenedicarboxylic chloride aminobenzoate terminated
    polystyrene copolymer dielec film; porous dielec film
    polystyrene polyamine cardo block; heat resistant
    porous polybenzoxazole dielec film forming block
    polyamide
IT
    Polycarbonates, uses
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (cardo, polyacetylene-polybenzoxazole-; polyamide compns. for
        heat-resistant insulator films with uniform fine
        cells and low dielec. constant useful for semiconductor
        devices)
ΙT
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (cardo, polybenzoxazole-; polyamide compns. for heat
        -resistant insulator films with uniform fine cells and low
        dielec. constant useful for semiconductor devices)
     Polyamides, uses
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (cardo, polystyrene-, block; polyamide compns. for heat-
        resistant insulator films with uniform fine cells and low
        dielec. constant useful for semiconductor devices)
     Polybenzoxazoles
TТ
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (cardo, polystyrene-; polyamide compns. for heat-
        resistant insulator films with uniform fine cells and low
        dielec. constant useful for semiconductor devices)
     Porous materials
IT
        (films, dielec.; polyamide compns. for heat-
        resistant insulator films with uniform fine cells and low
        dielec. constant useful for semiconductor devices)
IT
     Polyamides, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyacetylene-, polyoxyalkylene-, cardo, block; polyamide compns. for
        heat-resistant insulator films with uniform fine
        cells and low dielec. constant useful for semiconductor
        devices)
IT
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-, cardo; polyamide compns. for
        heat-resistant insulator films with uniform fine
```

cells and low dielec. constant useful for semiconductor devices)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyacetylene-polyoxyalkylene-, cardo; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Heat-resistant materials

Semiconductor devices

(polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polyoxyalkylenes, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-, block, cardo; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polycarbonates, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-, polyacetylene-, block, cardo; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polyacetylenes, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-, polyoxyalkylene-, cardo, block; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

Polyoxyalkylenes, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-polycarbonate-, block, cardo; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polvesters, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-polycarbonate-, block; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polycarbonates, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-polyester-, block; polyamide compns. for heatresistant insulator films with uniform fine cells and low

```
dielec. constant useful for semiconductor devices)
тт
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyamide-polyether-, block; polyamide compns. for heat-
        resistant insulator films with uniform fine cells and low
        dielec, constant useful for semiconductor devices)
TТ
     Polycarbonates, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyamide-polyoxyalkylene-, block, cardo; polyamide compns. for
        heat-resistant insulator films with uniform fine
        cells and low dielec. constant useful for semiconductor
        devices)
IT
     Polyethers, uses
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyamide-polyoxyalkylene-, block; polyamide compns. for heat
        -resistant insulator films with uniform fine cells and low
        dielec. constant useful for semiconductor devices)
IΤ
    Cardo polymers
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
    use); PREP (Preparation); USES (Uses)
        (polyamides, polystyrene-, block; polyamide compns. for
       heat-resistant insulator films with uniform fine
        cells and low dielec. constant useful for semiconductor
       devices)
IT
    Polvesters, uses
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, polycarbonate-; polyamide compns. for
       heat-resistant insulator films with uniform fine
       cells and low dielec. constant useful for semiconductor
       devices)
    Polvethers, uses
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, polyoxyalkylene-; polyamide compns. for
       heat-resistant insulator films with uniform fine
       cells and low dielec. constant useful for semiconductor
       devices)
IT
    Polyacetylenes, uses
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-, cardo; polyamide compns.
        for heat-resistant insulator films with uniform
        fine cells and low dielec. constant useful for semiconductor
       devices)
IT
    Cardo polymers
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazoles, polystyrene-; polyamide compns. for
```

heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

### IT Polyamides, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polycarbonate-, polyacetylene-, block, cardo; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec, constant useful for semiconductor

cells and low dielec. constant useful for semiconductor devices)

### IT Polyoxyalkylenes, uses

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polycarbonate-, polybenzoxazole-, cardo; polyamide compns.

for heat-resistant insulator films with uniform

fine cells and low dielec. constant useful for semiconductor devices)

# IT Polyamides, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polycarbonate-polyester-, block; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

#### IT Polyamides, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polycarbonate-polyoxyalkylene-, block, cardo; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

# IT Cardo polymers

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polycarbonates, polyacetylene-polybenzoxazole-; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

# IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyester-, polycarbonate-; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

#### IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, polyoxyalkylene-; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

# IT Polyamides, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-polyoxyalkylene-, block; polyamide compns. for heat -resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polyamides, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyoxyalkylene-, block, cardo; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Polycarbonates, uses

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyoxyalkylene-, polybenzoxazole-, cardo; polyamide compns.

for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Cardo polymers

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyoxyalkylenes, polybenzoxazole-; polyamide compns. for

heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Films

(porous, dielec.; polyamide compns. for heatresistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

IT Dielectric films

(porous; polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

75-21-8DP, Oxirane, reaction products with polystyrene and TT 4-nitrobenzoic acid, hydrogenated, polymers with dicarboxylic dichloride and aminohydroxyphenylfluorene 110-54-3DP, Hexane, 1,6-derivs., polycarbonates, block polymers with aminohydroxyphenylfluorene, (amino-terminated polyoxyalkylenes,) and acetylenic group-containing dicarboxylic acid dichlorides 122-04-3DP, esters with hydroxy-terminated polystyrene, hydrogenated, polymers with dicarboxylic dichloride and aminohydroxyphenylfluorene 4194-40-5DP, 3,3'-Diamino-4,4'dihydroxybiphenyl, block polymers with polyester-polycarbonate diol, 5-ethynylisophthalic dichloride, and 5-phenylethynylterephthalic dichloride 9046-10-0DP, Polypropylene glycol bis(2-aminopropyl) ether, block polymers with aminohydroxyphenylfluorene, polycarbonate diols, (amino-terminated polyoxyalkylenes,) and acetylenic group-containing dicarboxylic acid dichlorides 16819-44-6DP, block polymers with polycarbonate diol and 9,9-bis(4-amino-3-hydroxyphenyl)fluorene 152480-72-3DP, 9,9-Bis(4-amino-3-hydroxyphenyl)fluorene, block polymers with polycarbonate diols, (amino-terminated polyoxyalkylenes,) and acetylenic group-containing dicarboxylic acid dichlorides 393543-05-0DP, block polymers with diaminodihydroxy-containing fluorenyl (biphenyl), (amino-terminated polyoxypropylene,) polycarbonate diol, and ethynyl-containing dicarboxylic acid dichlorides 393543-14-1DP, block

polymers with 9,9-bis(4-amino-3-hydroxyphenyl)fluorene, amino-terminated polyoxypropylene, polycarbonate diol, and 5-ethynylisophthalic dichloride 562870-37-5DP, block polymers with 3,3'-diamino-4,4'-dihydroxybiphenyl, polyester-polycarbonate diol, and 5-ethynylisophthalic dichloride 640750-13-6P 640750-14-7P 640750-15-8P 640750-16-9P 640750-72-7P, 9,9-Bis(4-amino-3-hydroxyphenyl)fluorene-ED 2003-4,4'-tolane dicarboxylic acid dichloride block copolymer 640750-73-8P, 9,9-Bis(4-amino-3-hydroxyphenyl)fluorene-ED 2003-5-ethynylisophthalic acid dichloride-5-phenylethynyl isophthalic acid dichloride-polypropylene glycol bis(2-aminopropyl) ether block copolymer 641611-57-6P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide compns. for heat-resistant insulator films with uniform fine cells and low dielec. constant useful for semiconductor devices)

L30 ANSWER 5 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004

2004:19987 CAPLUS

DOCUMENT NUMBER:

140:60850

TITLE:

Insulation film materials, varnishes containing them, polyoxazole-based microporous films with low moisture

absorption manufactured from them, and

semiconductor devices using them

INVENTOR(S):
PATENT ASSIGNEE(S):

Ishikawa, Tadahiro; Enoki, Naoshi; Saito, Hidenori

Sumitomo Bakelite Co., Ltd., Japan Jpn. Kokai Tokkyo Koho, 34 pp.

CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

SOURCE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

APPLICATION NO. DATE KIND DATE PATENT NO. ----JP 2004002722 A2 20040108 JP 2003-74571 20030318 JP 2002-87068 A 20020326 PRIORITY APPLN. INFO.: The materials, useful for interlayer dielecs. and protection films, contain reaction products of polyamides  $[HNX (OR1) (OR2) NHC:OY1C:O] \\ k [HNX (OR3) (OR4) NHC:OY2C:O] \\ m [HNX (OR5) (OR6) NHC:OY3C:O] \\ m [HNX (OR5) (OR6) (OR6) NHC:OY3C:O] \\ m [HNX (OR5) (OR6) (OR6) (OR6) (OR6) \\ m [HNX (OR5) (OR6) (OR6) (OR6) (OR6) (OR6) \\ m [HNX (OR5) (OR6) (OR6) (OR6) (OR6) (OR6) (OR6) \\ m [HNX (OR5) (OR6) (O$ :0]n (R1-6 = H, monovalent organic group; X = tetravalent aromatic group; Y1-3 divalent aromatic group; k, m >0;  $n \ge 0$ ; k + m + n = 2-1000; (k + m)/(k)+ m + n) 0.05-1) and reactive oligomers. Thus, a methylpyrrolidone solution containing a copolymer prepared from 3,3'-diamino-4,4'dihydroxybiphenyl 19.46, 5-ethynylisophthalic dichloride 11.35, 5-phenylethynylisophthalic dichloride 15.16, and 4-aminobenzoate ester-terminated styrene oligomer 28.80 g was applied on an Al-deposited Si wafer and heated at 300° for 60 min and at 400° for 60 min to give a test piece showing relative dielec. constant 2.20, heat-decomposition temperature 540°, glass-transition temperature >450°, and water absorption 0.3%.

# IT 638189-51-2P

RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant

or reagent); USES (Uses)

(polyamide-based varnishes for microporous polybenzoxazole insulation films with low moisture absorption for semiconductor devices)

RN 638189-51-2 CAPLUS

NN 538169-51-2 CAPLOS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with
α-(2-aminopropyl)-ω-(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and
5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1 CMF C16 H8 C12 O2

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2

$$\begin{array}{c} 0 \\ \parallel \\ \text{C1-C} \\ \downarrow \\ \text{C-C1} \\ \parallel \\ \text{O} \end{array}$$

CM 3

CRN 26403-64-5

CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 4

CRN 20638-07-7 CMF C25 H20 N2 O2

IC ICM C08G069-48

ICS C09D005-25; C09D179-04; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

ST elec insulator film polybenzoxazole semiconductor protection; polyamide polystyrene copolymer varnish microporous film;

protection; polyamide polystyrene copolymer varnish micropore semiconductor interlayer dielec low moisture absorption

IT Heat-resistant materials

(films; polyamide-based varnishes for microporous polybenzoxazole insulation films with low moisture absorption for semiconductor devices)

IT Films

(heat-resistant; polyamide-based varnishes for microporous polybenzoxazole insulation films with low moisture absorption for semiconductor devices)

IT Polyesters, uses

Polyoxyalkylenes, uses
RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
engineered material use); PREP (Preparation); RACT (Reactant or reagent);
USES (Uses)

(polyamide-; polyamide-based varnishes for microporous polybenzoxazole insulation films with low moisture absorption for semiconductor devices)

IT Dielectric films

```
Plastic films
    Semiconductor devices
        (polyamide-based varnishes for microporous polybenzoxazole
       insulation films with low moisture absorption for semiconductor
       devices)
IT
    Polyamides, uses
    RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
     engineered material use); PREP (Preparation); RACT (Reactant or reagent);
    USES (Uses)
        (polyamide-based varnishes for microporous polybenzoxazole
        insulation films with low moisture absorption for semiconductor
       devices)
IT
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
    use); PREP (Preparation); USES (Uses)
        (polyamide-based varnishes for microporous polybenzoxazole
       insulation films with low moisture absorption for semiconductor
       devices)
TT
    Polyesters, uses
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
    use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; polyamide-based varnishes for microporous
       polybenzoxazole insulation films with low moisture absorption
       for semiconductor devices)
TT
    Polyamides, uses
    RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
     engineered material use); PREP (Preparation); RACT (Reactant or reagent);
     USES (Uses)
        (polyester-; polyamide-based varnishes for microporous
       polybenzoxazole insulation films with low moisture absorption
        for semiconductor devices)
TТ
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
    use); PREP (Preparation); USES (Uses)
        (polyester-; polyamide-based varnishes for microporous
       polybenzoxazole insulation films with low moisture absorption
       for semiconductor devices)
    Polyamides, uses
IT
    RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
     engineered material use); PREP (Preparation); RACT (Reactant or reagent);
     USES (Uses)
        (polyoxyalkylene-; polyamide-based varnishes for microporous
       polybenzoxazole insulation films with low moisture absorption
        for semiconductor devices)
    Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyoxyalkylene-; polyamide-based varnishes for microporous
       polybenzoxazole insulation films with low moisture absorption
        for semiconductor devices)
```

23351-91-9P, 5-Bromoisophthalic acid 51760-21-5P, Dimethyl

5-bromoisophthalate 168619-21-4P 217655-36-2P, 1-[3,5-

IT

```
4-[3,5-Bis(methoxycarbonyl)phenyl]-2-methyl-3-butyn-1-ol
                                                                393543-04-9P,
     5-Ethynylisophthalic acid dipotassium salt 393543-05-0P,
     5-Ethynylisophthaloyl dichloride
                                        393543-14-1P, 5-(2-
     Phenylethynyl) isophthaloyl dichloride
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (for polyamide preparation; polyamide-based varnishes for
        microporous polybenzoxazole insulation films with low
        moisture absorption for semiconductor devices)
TТ
     99-31-0, 5-Aminoisophthalic acid 115-19-5, 3-Methyl-1-butyn-3-ol
     358-23-6, Trifluoromethanesulfonic anhydride 7719-09-7, Thionyl chloride
     13036-02-7, Dimethyl 5-hydroxyisophthalate
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (for polyamide preparation; polyamide-based varnishes for
        microporous polybenzoxazole insulation films with low
        moisture absorption for semiconductor devices)
     122-04-3DP, 4-Nitrobenzoic acid chloride, reaction products with
IT
     polystyrene, polymethyl methacrylate, or polycaprolactone diol and
     polyamides 9003-53-6DP, Polystyrene, aminobenzoate-terminated,
     reaction products with polyamides
                                        9011-14-7DP,
     Poly(methyl methacrylate), aminobenzoate-terminated, reaction
     products with polyamides 25014-31-7DP,
     \alpha-Methylstyrene polymer, amino-terminated, reaction products
     with polyamides 25248-42-4DP, Polycaprolactone, SRU, diol
     derivs., aminobenzoate-terminated, reaction products with
     polyamides
                  110736-71-5DP, Placcel 240, aminobenzoate-terminated,
     reaction products with polyamides 582294-69-7DP,
     reaction products with aminobenzoate-terminated oligomers
     638189-50-1DP, reaction products with aminobenzoate-terminated
     polycaprolactone 638189-51-2P
                                     638189-52-3P
     RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical
     or engineered material use); PREP (Preparation); RACT (Reactant
     or reagent); USES (Uses)
        (polyamide-based varnishes for microporous polybenzoxazole
        insulation films with low moisture absorption for semiconductor
        devices)
L30 ANSWER 6 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                         2004:17958 CAPLUS
DOCUMENT NUMBER:
                         140:60818
TITLE:
                         Manufacture of organic insulating films with
                         good heat stability and low water absorption and of
                         their materials
INVENTOR(S):
                         Izumi, Atsushi; Murayama, Kazumoto
PATENT ASSIGNEE(S):
                         Sumitomo Bakelite Co., Ltd., Japan
SOURCE:
                         Jpn. Kokai Tokkyo Koho, 33 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:
                         Patent
LANGUAGE:
                         Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
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Bis (methoxycarbonyl) phenyl] -2-phenylethyne 393543-03-8P,

KIND DATE PATENT NO. APPLICATION NO. DATE ---------JP 2003-78918 20030320 JP 2004002735 A2 20040108 PRIORITY APPLN. INFO.: JP 2002-96319 A 20020329 The title films, satisfying thickness 0.05-100  $\mu m$  and average surface roughness (Ra) ≤5% of the thickness, are manufactured by application of organic solvent-based dielec. dispersions or solns. on substrates followed by heat treatment. In the preparation of the dielecs., two kinds of bivalent bisaminophenols (Markush given) are reacted with ethynyl-containing dicarboxylic acids having bivalent functional groups (Markush given) to form polyamides which are then reacted with oligomers having substituents reactive to carboxyl, amino, or hydroxy of the polyamides to give copolymers. The films are useful for cover-coat layers, solder resists, liquid crystal alignment layers, etc. Thus, 3,3'-diamino-4,4'-dihydroxydiphenyl ether 45, 4,4'-diamino-3,3'dihydroxydiphenyl ether 45, 5-phenylethynylisophthaloyl dichloride 50, and 5-ethynylisophthaloyl dichloride 50 mmol were polymerized at 25° in NMP and then reacted with 9 mmol polypropylene glycol bis(2-aminopropyl) ether in the presence of Et3N to give a copolymer of Mw 45,000, which was dissolved in cyclohexanone, applied on a Si wafer, and heat treated at 90° and then baked at 400° to give a polybenzoxazole resin layer showing Ra 0.3% of the thickness, Tg >450°, and water absorption 0.2%. IT 638163-47-0P 638163-49-2P

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses) (manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

RN 638163-47-0 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-(phenylethynyl)-, polymer with  $\alpha$ -(2-aminomethylethyl)- $_{0}$ -(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)], 2-ethynyl-1,4-benzenedicarbonyl dichloride, 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 3,3'-oxybis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM :

CN

CRN 393543-14-1 CMF C16 H8 C12 O2

CRN 393543-09-4 CMF C10 H4 Cl2 O2

CM 3

CRN 152480-72-3 CMF C25 H20 N2 O2

CRN 20817-05-4 CMF C12 H12 N2 O3

CM 5

CRN 9046-10-0 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$H_2N-CH_2-CH_2-O$$
  $(C_3H_6)-O$   $n$   $CH_2-CH_2-NH_2$ 

2 (D1-Me)

RN 638163-49-2 CAPLUS CN 1,3-Benzenedicarbonyl dichloride, 5-(phenylethynyl)-, polymer with 2-ethynyl-1,4-benzenedicarbonyl dichloride, 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 3,3'-oxybis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1 CMF C16 H8 Cl2.O2

CM 2

CRN 393543-09-4 CMF C10 H4 Cl2 O2

CM 3

CRN 152480-72-3 CMF C25 H20 N2 O2

CRN 20817-05-4 CMF C12 H12 N2 O3

IC ICM C08G081-00

ICS B05D003-02; B32B005-18; B32B007-02; B32B027-34; H01L021-312; H05K003-28; H05K003-46

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST diaminodihydroxydiphenyl ether ethynylisophthaloyl chloride polybenzoxazole dielec film; heat resistant dielec polybenzoxazole film water absorption; polyoxypropylene aminopropyl ether polybenzoxazole block dielec film; porous dielec film pyrolyzable oligomer polymd

IT Heat-resistant materials

(dielec., porous, films; manufacture of organic
dielec. films with good heat stability and low water absorption
for electronic devices)

IT Porous materials

(films, dielec., heat resistant; manufacture of organic dielec. films with good heat stability

and low water absorption for electronic devices)

IT Electric insulators

(heat-resistant, porous, films; manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

IT Polyethers, uses

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polybenzoxazole-; manufacture of organic dielec.

films with good heat stability and low water absorption for electronic devices)  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left$ 

IT Polyethers, uses

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyester-, block, diol derivs., reaction products with ethynyl-containing polybenzoxazoles; manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

IT Polyesters, uses

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyether-, block, diol derivs., reaction products with ethymyl-containing polybenzoxazoles; manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-; manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices) Films

(porous, dielec., heat resistant;

manufacture of organic dielec. films with good heat stability
and low water absorption for electronic devices)

IT Dielectric films

IT

(porous, heat-resistant; manufacture of organic dielec. films with good heat stability and low water absorption for electronic devices)

IT 150-13-0DP, 4-Aminobenzoic acid, reaction products with
 oligomeric polystyrene and polybenzoxazoles 638163-45-8P
 638163-46-9P 638163-47-0P 638163-48-1P 638163-49-2P
 638163-50-5DP, reaction products with aminobenzoate-terminated
 styrene oligomers

RL: IMF (Industrial manufacture); PEP (Physical, engineering or

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chemical process); PYP (Physical process); TEM (Technical or engineered
     material use); PREP (Preparation); PROC (Process); USES (Uses)
        (manufacture of organic dielec. films with good heat
        stability and low water absorption for electronic devices)
    75-21-8, Ethylene oxide, reactions 122-04-3, 4-Nitrobenzoic acid
IT
              110736-71-5, Placcel 240
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (manufacture of organic dielec. films with good heat
       stability and low water absorption for electronic devices)
IΤ
    9003-53-6DP, Polystyrene, reaction products with 4-aminobenzoic
    acid and polybenzoxazoles
                                9011-14-7DP, Poly(methyl
    methacrylate), reaction products with 4-aminobenzoic acid and
    polybenzoxazoles
                      25014-31-7DP, \alpha-Methylstyrene
    homopolymer, p-aminobenzoate-terminated, reaction products with
    polybenzoxazoles 25248-42-4DP, Polycaprolactone, diol derivs.,
    p-aminobenzoate ester, reaction products with ethynyl-containing
    polybenzoxazoles
    RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
    process); PYP (Physical process); TEM (Technical or engineered material
    use); PREP (Preparation); PROC (Process); USES (Uses)
       (oligomeric; manufacture of organic dielec. films with good
       heat stability and low water absorption for electronic devices)
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L30 ANSWER 7 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:5183 CAPLUS

DOCUMENT NUMBER:

140:77584

TITLE:

Manufacture of poly(o-hydroxyamides

) and polybenzoxazoles as

dielectrics

INVENTOR(S):

Sezi, Recai; Walter, Andreas; Maltenberger, Anna; Lowack, Klaus

PATENT ASSIGNEE(S):

Infineon Technologies Ag, Germany

SOURCE:

Eur. Pat. Appl., 37 pp.

CODEN: EPXXDW

DOCUMENT TYPE:

Patent

LANGUAGE:

FAMILY ACC. NUM. COUNT: 1

German

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1375559	A1	20040102	EP 2003-13753	20030617
R: AT, BE,	CH, DE,	DK, ES, FR,	GB, GR, IT, LI, LU	NL, SE, MC, PT.
IE, SI,	LT, LV,	FI, RO, MK,	CY, AL, TR, BG, CZ	EE, HU, SK
DE 10228770	Al	20040212	DE 2002-10228770	
JP 2004068005	A2	20040304	JP 2003-183611	
CN 1468839	A	20040121	CN 2003-145283	20030627
US 2004063895	A1	20040401	US 2003-609460	20030627
PRIORITY APPLN. INFO	. :	1	DE 2002-10228770 A	20020627
AB Poly(o-hydroxyamides) were manufactured from				
o. bridge-read on the second of the second o				

o-hydroxydiamines and dicarboxylic acid chlorides and converted by heat-induced cyclization into polybenzoxazoles (structures

specified), which are useful as dielec. coatings for microelectronic devices with improved adhesion to substrates. For example, adding dropwise N-methylpyrrolidone (NMP) solution of 0.095 mol 9,9'-[4-(4-chlorocarbonyl)phenoxy]phenylfluorene to stirred NMP solution of 0.1 mol 9,9'-bis[4-((3-hydroxy-4-amino)phenoxy)phenyl]fluorene at 10°, stirring the mixture for 1 h at 10°, 1 h at 20°, cooling to 10° adding a solution of 0.01 mol 5-norbornene-2,3dicarboxylic anhydride (end-capping agent) in  $\gamma$ -butyrolactone (γ-BL), stirring 1 h at 10°, 1 h at 20°, adding pyridine, diluting with  $\gamma$ -BL and precipitating in H2O/Me2CHOH gave a poly(ohydroxyamide). A solution of this polymer in NMP or  $\gamma ext{-BL}$  was spin-coated on Ti nitride-sputtered Si wafer, the resulting film was soft-baked for 1 min at 120°, 10 Ti nitride-sputtered chips were pressed on the film and the whole was heated for 1 h at 425° to convert poly(o-hydroxyamide) film to polybenzoxazole coating. The average separation force of the chips from the coating was 18.07 N/mm2.

hydroxyamides) and polybenzoxazoles as heat -resistant dielecs.)

RN 640294-92-4 CAPLUS

Benzoyl chloride, 4,4'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 383435-04-9 CMF C39 H24 Cl2 O4

CRN 359642-31-2 CMF C37 H28 N2 O4

RN 640294-94-6 CAPLUS

Benzoyl chloride, 4,4'-[(diphenylmethylene)bis(4,1-phenyleneoxy)]bis-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 640294-93-5

# CMF C39 H26 C12 O4

$$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \end{array}$$

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

IC ICM C08G069-26

ICS C08G073-22; C08G069-32; H01B003-30

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 76

ST polyhydroxyamide manuf cyclization polybenzoxazole dielec coating; silicon substrate adhesion polybenzoxazole dielec coating manuf

; fluorene phenyl hydroxyaminophenyloxy condensation polyhydroxyamide manuf cyclization;

 ${\tt chlorocarbonyl} phenoxyphenyl fluorene \ {\tt condensation} \ {\tt polyhydroxyamide} \\ {\tt manuf} \ {\tt cyclization}$ 

IT Polyamides, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(aromatic, manufacture and thermal cyclization; manufacture of

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poly(o-hydroxyamides) and polybenzoxazoles as
        heat-resistant dielecs.)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (coatings; manufacture of poly(o-hydroxyamides) and
        polybenzoxazoles as heat-resistant
        dielecs.)
ΙT
     Heat-resistant materials
        (dielec.; manufacture of poly(o-hydroxyamides)
        and polybenzoxazoles as)
IT
     Coating materials
        (heat-resistant, dielecs.; manufacture of
        poly(o-hydroxyamides) and polybenzoxazoles as)
IT
     Electric insulators
        (heat-resistant; manufacture of poly(o-
        hydroxyamides) and polybenzoxazoles as)
IT
     Microelectronic devices
        (manufacture of poly(o-hydroxyamides) and
        polybenzoxazoles as heat-resistant dielecs.
IT
     Electric circuits
        (microcircuits; manufacture of poly(o-hydroxyamides) and
        polybenzoxazoles as heat-resistant dielecs.
        for)
TT
     72123-18-3P
                 383435-25-4P 640294-97-9P 640294-98-0P
                                                                640294-99-1P
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (coating; manufacture of poly(o-hydroxyamides) and
        polybenzoxazoles as heat-resistant
IT
     62-53-3DP, Aniline, reaction products with poly(o-
     hydroxyamide)
                     826-62-0DP, 5-Norbornene-2,3-dicarboxylic
     anhydride, reaction products with poly(o-hydroxyamide)
     920-46-7DP, Methacryloyl chloride, reaction products with
     poly(o-hydroxyamide) 383435-17-4P 512172-72-4DP, end-capped
     with norbornenecarboxylic chloride 640294-92-4DP, end-capped
     with norbornenedicarboxylic anhydride 640294-94-6DP, end-capped
     with aniline 640294-95-7DP, end-capped with methacryloyl chloride
     640294-96-8DP, end-capped with methacryloyl chloride
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP
     (Preparation); RACT (Reactant or reagent)
        (manufacture and cyclization; manufacture of poly(o-
        hydroxyamides) and polybenzoxazoles as heat
        -resistant dielecs.)
     27063-48-5DP, reaction products with poly(o-hydroxyamide
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (manufacture of poly(o-hydroxyamides) and
       polybenzoxazoles as heat-resistant
       dielecs.)
REFERENCE COUNT:
                              THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
```

# RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 8 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2003:912293 CAPLUS

DOCUMENT NUMBER:

139:396313

TITLE:

Polybenzoxazole dielectrics with

self-generated pores and o-hydroxyamide monomers for manufacture of these porous

dielectrics

INVENTOR(S):

Sezi, Recai; Walter, Andreas; Lowack, Klaus;

Maltenberger, Anna; Banfic, Robert Infineon Technologies AG, Germany

PATENT ASSIGNEE(S): SOURCE:

Ger. Offen., 26 pp.

CODEN: GWXXBX

DOCUMENT TYPE: LANGUAGE:

Patent German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

DE 10218788 A1 20031120 DE 2002-10218788 20020426
US 200402821 A1 20040212 US 2003-424376 20030428
PRIORITY APPLN. INFO.: DE 2002-10218788 A 20020426

AB The invention concerns poly-o-hydroxyamides with binaphthyl groups in the repeating units. These poly-o-hydroxyamides are cyclized by heating to polybenzoxazole dielecs. containing pores of the size the the dielec. constant is <2.5.

IT 625444-13-5DP, reaction products with methacrylic acid
RL: IMF (Industrial manufacture); PREP (Preparation)
(binaphthyl group-containing polybenzoxazole dielecs. with self-generated pores and lower dielec. constant)

RN 625444-13-5 CAPLUS

CN 2,6-Naphthalenedicarbonyl dichloride, polymer with 3,3'-[[1,1'-binaphthalene]-2,2'-diylbis(oxy)]bis[6-aminophenol], 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and 5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 625444-02-2 CMF C32 H24 N2 O4

CRN 393543-14-1 CMF C16 H8 Cl2 O2

CM 3

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 4

CRN 2351-36-2

CMF C12 H6 C12 O2

IT 625444-06-6DP, reaction products with methacrylic acid, cyclized 625444-10-2DP, reaction products with norbornenedicarboxylic acid anhydride, cyclized 625444-11-3DP, reaction products with norbornenecarbonyl chloride, cyclized RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(binaphthyl group-containing polybenzoxazole dielecs. with self-generated pores and lower dielec. constant)

RN 625444-06-6 CAPLUS

1,4-Benzenedicarbonyl dichloride, polymer with 3,3'-diamino[1,1'-binaphthalene]-2,2'-diol (9CI) (CA INDEX NAME)

CM 1

CN

CRN 625444-05-5 CMF C20 H16 N2 O2

CM 2

CRN 100-20-9 CMF C8 H4 Cl2 O2

RN 625444-10-2 CAPLUS

CN Benzoyl chloride, 4,4'-oxybis-, polymer with 3,3'-[[1,1'-binaphthalene]2,2'-diylbis(oxy)]bis[6-aminophenol] and 3,3'-diamino[1,1'-binaphthalene]2,2'-diyl diacetate (9CI) (CA INDEX NAME)

CM 1

CRN 625444-09-9 CMF C24 H20 N2 O4

CM 2

CRN 625444-02-2 CMF C32 H24 N2 O4

CM 3

CRN 7158-32-9 CMF C14 H8 C12 O3

RN 625444-11-3 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-(phenylethynyl)-, polymer with 3,3'-diamino[1,1'-binaphthalene]-2,2'-diol, 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and 4,4'-oxybis[benzoyl chloride] (9CI) (CA INDEX NAME)

CM 1

CRN 625444-05-5 CMF C20 H16 N2 O2

CM 2

CRN 393543-14-1 CMF C16 H8 Cl2 O2

$$\begin{array}{c} 0 \\ || \\ || \\ || \\ || \\ || \\ C - C1 \\ || \\ 0 \end{array}$$

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 4

CRN 7158-32-9 CMF C14 H8 C12 O3

IC ICM C08G073-22

ICS C08G069-44; C09D005-25; B32B015-08; H05K001-03

CC 35-5 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 76

ST polyhydroxyamide binaphthyl contg manuf precursor polybenzoxazole dielec

IT Dielectric films

(binaphthyl group-containing polybenzoxazole dielecs. with self-generated pores and lower dielec. constant)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(binaphthyl group-containing polybenzoxazole dielecs. with self-generated pores and lower dielec. constant)

IT Electric apparatus

(binaphthyl group-containing polybenzoxazole dielecs. with self-generated pores and lower dielec. constant for electronic parts)

IT Polyamides, preparation

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,

IT

TΨ

IT

INVENTOR(S):

PATENT ASSIGNEE(S):

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engineering or chemical process); PREP (Preparation); PROC (Process)
         (ortho-hydroxy, precursors; binaphthyl group-containing
        polybenzoxazole dielecs. with self-generated pores and lower
        dielec. constant)
ΙŤ
     625444-13-5DP, reaction products with methacrylic acid
     RL: IMF (Industrial manufacture); PREP (Preparation)
         (binaphthyl group-containing polybenzoxazole dielecs. with
        self-generated pores and lower dielec. constant)
IT
     79-41-4DP, Methacrylic acid, reaction products with binaphthyl
     group-containing poly-o-hydroxyamides, cyclized 826-62-0DP,
     5-Norbornene-2,3-dicarboxylic acid anhydride, reaction products
     with binaphthyl group-containing poly-o-hydroxyamides, cyclized
     27063-48-5DP, 5-Norbornene-2-carbonyl chloride, reaction products
     with binaphthyl group-containing poly-o-hydroxyamides, cyclized
     625444-03-3DP, reaction products with norbornenedicarboxylic
     acid anhydride, cyclized 625444-04-4DP, reaction products with
     norbornenedicarboxylic acid anhydride, cyclized 625444-06-6DP,
     reaction products with methacrylic acid, cyclized
     625444-07-7DP, reaction products with methacrylic acid. cyclized
     625444-08-8DP, reaction products with norbornenecarbonyl
     chloride, cyclized 625444-10-2DP, reaction products
     with norbornenedicarboxylic acid anhydride, cyclized 625444-11-3DP
     , reaction products with norbornenecarbonyl chloride, cyclized
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (binaphthyl group-containing polybenzoxazole dielecs. with
        self-generated pores and lower dielec. constant)
     625444-01-1P, 2,2'-Diacetoxy-3,3'-dinitro-1,1'-binaphthyl
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (monomer precursor; binaphthyl group-containing polybenzoxazole
        dielecs. with self-generated pores and lower dielec. constant)
     602-09-5, 2,2'-Dihydroxy-1,1'-binaphthyl
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (monomer precursor; binaphthyl group-containing polybenzoxazole
        dielecs. with self-generated pores and lower dielec. constant)
     625444-00-0P, 2,2'-Diacetoxy-3,3'-diamino-1,1'-binaphthyl dihydrochloride
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (monomer; binaphthyl group-containing polybenzoxazole dielecs.
        with self-generated pores and lower dielec. constant)
REFERENCE COUNT:
                               THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
L30 ANSWER 9 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                         2003:809399 CAPLUS
DOCUMENT NUMBER:
                         139:308585
TITLE:
                         Materials and coating varnishes for
                         polybenzoxazole-based electrically
```

insulating films and semiconductor devices

Sumitomo Bakelite Co., Ltd., Japan

Hase, Yoko

SOURCE:

Jpn. Kokai Tokkyo Koho, 22 pp.

CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT: PATENT INFORMATION:

PATENT NO KIND DATE APPLICATION NO. DATE JP 2003292615 A2 20031015

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JP 2002-105783 20020408

PRIORITY APPLN. INFO.:

JP 2002-105783

20020408

Title materials contain polyamide [HNX(OH)2NHC(:O)ZC(:O)]m[HNY(OH)2NHC(:O)

ZC(:0)]n film-forming components (X, Y,  $Z = \ge 1$  group selected from specified group in the document; m, n >0; m + n = 2-1000;  $0.4 \le$ 

m/(m + n) <1). The films are obtained by heating varnishes containing the materials and organic solvents for condensation and crosslinking. The semiconductor devices have the films as interlayer insulating films and/or surface-protective layers. Thus, a polybenzoxazole film

prepared from 3,3'-diamino-4,4'-dihydroxybiphenyl,

3,3'-bis[3-cyclohexyl-5-(4-amino-3-hydroxyphenoxy)phenyl]propane, and 5-ethynylisophthalic dichloride showed dielec. constant 2.65 at 1

MHz and glass transition temperature >450°.

IT 610269-11-9P

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide materials for polybenzoxazole-based elec

. insulating films in semiconductors)

RN 610269-11-9 CAPLUS

CN2,7-Biphenylenedicarbonyl dichloride, polymer with 3,3'-diamino[1,1'biphenyl]-4,4'-diol and 3,3'-[1,4-phenylenebis[(1-methylethylidene)(2cyclohexyl-6-methyl-4,1-phenylene)oxy]]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 610269-07-3 CMF C50 H60 N2 O4

CRN 69417-81-8 CMF C14 H6 C12 O2

CM 3

CRN 4194-40-5 CMF C12 H12 N2 O2

IC ICM C08G069-26

ICS H01B003-30; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

Heat-resistant materials

ST polyamide polybenzoxazole insulating film heat resistance; dielec const polybenzoxazole insulating film semiconductor

(f

TΤ

(films; polyamide materials for polybenzoxazole-based elec. insulating films in semiconductors)

IT Films

(heat-resistant; polyamide materials for polybenzoxazole-based elec. insulating films in semiconductors)

IT Dielectric films

Semiconductor devices

(polyamide materials for polybenzoxazole-based elec . insulating films in semiconductors)

IT Polybenzoxazoles

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-; polyamide materials for polybenzoxazole-based elec. insulating films in semiconductors)

IT Polyamides, uses

```
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
      (Technical or engineered material use); PREP (Preparation); USES (Uses)
         (polybenzoxazole-; polyamide materials for
        polybenzoxazole-based elec. insulating films in
        semiconductors)
     23351-91-9P, 5-Bromoisophthalic acid
IT
                                            51760-21-5P, Dimethyl
     5-bromoisophthalate 168619-21-4P 217655-36-2P 393543-03-8P.
     4-[3,5-Bis(methoxycarbonyl)phenyl]-2-methyl-3-butyn-1-ol 393543-04-9P,
     Dipotassium 5-ethynylisophthalate
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
         (intermediates in monomer preparation; polyamide materials for
        polybenzoxazole-based elec. insulating films in
        semiconductors)
     393543-05-0P
                    393543-14-1P
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (monomers; polyamide materials for polybenzoxazole-based
        elec. insulating films in semiconductors)
ΙT
     610269-04-0P
                   610269-06-2P 610269-08-4P 610269-09-5P 610269-10-8P
     610269~11-9P
     RL: DEV (Device component use); IMF (Industrial manufacture);
     TEM (Technical or engineered material use); PREP (Preparation);
     USES (Uses)
        (polyamide materials for polybenzoxazole-based elec
        . insulating films in semiconductors)
     99-31-0D, 5-Aminoisophthalic acid, reactants in monomer preparation
IT
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (polyamide materials for polybenzoxazole-based elec
        . insulating films in semiconductors)
IT
     115-19-5, 3-Methyl-1-butyn-3-ol 358-23-6, Trifluoromethanesulfonic acid
                 13036-02-7, Dimethyl 5-hydroxyisophthalate
     anhydride
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reactants in monomer preparation; polyamide materials for
        polybenzoxazole-based elec. insulating films in
        semiconductors)
L30 ANSWER 10 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                         2003:767873 CAPLUS
DOCUMENT NUMBER:
                         139:277708
TITLE:
                         Polybenzoxazole-based electrically
                         insulating materials, their varnish, heat-
                         resistant porous insulator films, and
                         semiconductor devices having them
INVENTOR(S):
                         Hase, Yoko; Enoki, Naoshi
PATENT ASSIGNEE(S):
                         Sumitomo Bakelite Co., Ltd., Japan
SOURCE:
                         Jpn. Kokai Tokkyo Koho, 24 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:
                         Patent
LANGUAGE:
                        Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
```

PATENT NO. KIND DATE APPLICATION NO. DATE -------------------JP 2003277508 A2 20031002 JP 2002-87069 20020326 PRIORITY APPLN, INFO.: JP 2002-87069 20020326 The insulating materials are manufactured by reacting (A) polyamides having branches, which are formed by reacting bisaminophenols and trifunctional carboxylic acids selected from trimellitic acid, trimesic acid, 1,3,5-cyclohexanetricarboxylic acid, and biphenyl ether-3,3',5-tricarboxylic acid, and (B) oligomers having functional groups reactive to carboxy, amino, or OH groups in the polyamides. The polyamides have repeating units of [NHX (OH) 2NHCOYCO] m and [NHX (OH) 2NHCOZCO] n [X = tetravalent groups based on benzene, biphenyl, fluorene, etc.; Y = biphenylenylene, acetylene-containing phenylene, biphenylene, naphthylene, cyclohexylene, etc.; Z = phenylene, biphenylene, fluorenylene, cyclohexylene, etc.; m > 0;  $n \ge 0$ ; m + n = 02-1000; m/(m + n) = 0.05-1]. Thus, 3.3'-diamino-4.4'-dihydroxybiphenyl, trimesic acid trichloride, 5-phenylethynylisophthalic acid, and 5-ethynylisophthalic acid were polymerized, reacted with polypropylene glycol bis(2-aminopropyl) ether, dissolved in N-methyl-2-pyrrolidone, applied on an Al-deposited Si wafer, baked, and heated for forming micropores by decomposing polyoxyalkylene portions to give a porous polybenzoxazole film showing dielec. constant 1.90, Tg >450°, and water absorption 0.2%. 605624-38-2P IT

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses) (heated for micropore formation; polybenzoxazole-based insulating materials for heat-resistant porous insulator films)

RN 605624-38-2 CAPLUS

1,2,4-Benzenetricarbonyl trichloride, polymer with  $\alpha$ -(2-aminomethylethyl)- $\omega$ -(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)], 2,7-biphenylenedicarbonyl dichloride and 3,3'-diamino[1,1'-biphenyl]-4,4'-diol (9CI) (CA INDEX NAME)

CM 1

CN

CRN 69417-81-8 CMF C14 H6 Cl2 O2

CM 2

CRN 9046-10-0

CMF (C3 H6 O)n C6 H16 N2 O

CCI IDS, PMS

2 (D1-Me)

CM 3

CRN 4194-40-5 CMF C12 H12 N2 O2

CM 4

CRN 3867-55-8 CMF C9 H3 C13 O3

IC ICM C08G081-00

ICS C08G069-48; C09D179-04; H01B003-30; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

```
ST
     polybenzoxazole polyoxyalkylene varnish porous insulator film;
     semiconductor device insulator polybenzoxazole heat
     resistance
ΤТ
     Porous materials
        (films, insulator films; polybenzoxazole-based insulating
        materials for heat-resistant porous insulator
        films)
TΨ
     Semiconductor devices
        (insulator films for; polybenzoxazole-based insulating
        materials for heat-resistant porous insulator
        films)
     Polybenzoxazoles
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-, heated for micropore formation; polybenzoxazole
        -based insulating materials for heat-resistant
        porous insulator films)
     Polyoxyalkylenes, uses
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-polybenzoxazole-, heated for micropore formation;
        polybenzoxazole-based insulating materials for heat-
        resistant porous insulator films)
     Polybenzoxazoles
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-polyoxyalkylene-, heated for micropore formation;
       polybenzoxazole-based insulating materials for heat-
       resistant porous insulator films)
     Polyamides, uses
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-, heated for micropore formation;
       polybenzoxazole-based insulating materials for heat-
       resistant porous insulator films)
    Dielectric films
IT
        (polybenzoxazole-based insulating materials for heat
        -resistant porous insulator films)
IT
     Polyamides, uses
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
    use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-, heated for micropore
        formation; polybenzoxazole-based insulating materials for
       heat-resistant porous insulator films)
ΙT
    Films
        (porous, insulator films; polybenzoxazole-based insulating
       materials for heat-resistant porous insulator
```

films)

IT 100-21-0DP, Terephthalic acid, polymers with diaminophenols, carboxylic acids, and aminostyrene 4194-40-5DP, 3,3'-Diamino-4,4'dihydroxybiphenyl, polymers with carboxylic acids and aminostyrene 9003-53-6DP, Polystyrene, amino-terminated, polymers with diaminophenols and carboxylic acids 432025-99-5DP, polymers with diaminophenols, carboxylic acids, and aminostyrene 605624-36-0P, 3,3'-Diamino-4,4'dihydroxybiphenyl-5-ethynylisophthalic acid-5-phenylethynylisophthalic acid-trimesic acid trichloride-polypropylene glycol bis(2-aminopropyl) ether copolymer 605624-37-1P 605624-38-2P 605624-39-3P 605624-40-6DP, polymers with diaminophenols, carboxylic acids, and aminostyrene RL: CPS (Chemical process); IMF (Industrial manufacture); PEP

(Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(heated for micropore formation; polybenzoxazole-based insulating materials for heat-resistant porous insulator films)

IT 23351-91-9P, 5-Bromoisophthalic acid 51760-21-5P, Dimethyl 5-bromoisophthalate 69417-81-8P, 2,7-Biphenylenedicarbonyl dichloride 168619-21-4P 217655-36-2P, 1-[3,5-Bis(methoxycarbonyl)phenyl]-2phenylethyne 393543-03-8P 393543-04-9P, Dipotassium 5-Ethynylisophthalate 393543-05-0P, 5-Ethynylisophthaloyl dichloride 393543-14-1P, 5-(2-Phenylethynyl) isophthaloyl dichloride 432025-98-4P, Dipotassium 5-(2-phenylethynyl)isophthalate RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polybenzoxazole-based insulating materials for heat -resistant porous insulator films)

ΙT 99-31-0, 5-Aminoisophthalic acid 115-19-5, 3-Methyl-1-butyn-3-ol 358-23-6, Trifluoromethanesulfonic acid anhydride 13036-02-7, Dimethyl 5-hydroxyisophthalate

RL: RCT (Reactant); RACT (Reactant or reagent) (polybenzoxazole-based insulating materials for heat -resistant porous insulator films)

L30 ANSWER 11 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2003:767868 CAPLUS

DOCUMENT NUMBER:

139:293031

TITLE:

SOURCE:

Polyamide compositions, their varnishes, and

polybenzoxazole dielectric films manufactured from the varnishes for

semiconductor devices

INVENTOR (S): PATENT ASSIGNEE(S):

Saito, Hidenori; Enoki, Naoshi Sumitomo Bakelite Co., Ltd., Japan Jpn. Kokai Tokkyo Koho, 22 pp.

CODEN: JKXXAF

DOCUMENT TYPE: LANGUAGE:

Patent Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE ---- ----------JP 2003277499 A2 20031002 JP 2002-82006 20020322 PRIORITY APPLN. INFO.: JP 2002-82006 The compns. comprise (A) polyamides (NHX1NHCOY1CO) m (NHX2NHCOY2CO) n [m >0; n  $\geq$ 0; m + n = 2-1000, and m/(m + n) 0.05-1; X1, X2 = prescribed aromatic divalent group; Y1 = prescribed divalent group containing (substituted) ethynyl group, ethynylene group, or biphenylene group; Y2 = prescribed divalent group] and (B) modified polyalkylene glycols prepared by reaction of (1-2):1 (a) prescribed dicarboxylic acids containing (substituted) ethynyl groups, ethynylene groups, or biphenylene groups and (b) polyalkylene glycols and/or their amino derivs. Thus, a varnish containing (a) a polyamide prepared from 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane and 5-phenylethynylisophthalic acid dichloride and (b) a modified polyalkylene glycol prepared from poly(propylene glycol) bis(2-aminopropyl ether) and 5-ethynylisophthalic acid dichloride was applied on a substrate, heated at 300° for 60 min for crosslinking and forming benzoxazole rings, and heated at 400° for 60 min for decomposing the polyalkylene glycol component to give a porous polybenzoxazole film with average pore size ≤10 nm, relative dielec. constant (1 MHz) 2.0, and good heat resistance. IT 607739-29-7DP, thermally decomposed 607739-30-0DP, thermally decomposed RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); (polyamide compns. for porous polybenzoxazole dielec . films for semiconductor devices) RN 607739-29-7 CAPLUS CN 2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 4,4'-(1,2-ethynediyl)bis[benzoyl chloride], 3,3'-[9H-fluoren-9ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and  $\alpha$ -hydro- $\omega$ hydroxypoly(oxy-1,2-ethanediyl) (9CI) (CA INDEX NAME) CM CRN 405931-94-4 CMF C14 H6 C12 O2

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 3

CRN 25322-68-3 CMF (C2 H4 O)n H2 O CCI PMS

$$HO \longrightarrow CH_2 - CH_2 - O \longrightarrow n$$

CM 4

CRN 16819-44-6 CMF C16 H8 C12 O2

RN 607739-30-0 CAPLUS

CN 2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with  $\alpha\text{-}(4\text{-aminobenzoyl})\text{-}_{0}\text{-}[(4\text{-aminobenzoyl})\text{oxy}]\text{poly}(\text{oxy-1,4-butanediyl})$ , 3,3'-diamino[1,1'-biphenyl]-4,4'-diol and 2-ethynyl-1,4-benzenedicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CM 2

CRN 393543-09-4 CMF C10 H4 Cl2 O2

CM 3

CRN 54667-43-5 CMF (C4 H8 O)n C14 H12 N2 O3 CCI PMS

$$\begin{array}{c|c} & & & & & & & & \\ & & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ & \\ & & \\ &$$

CRN 4194-40-5 CMF C12 H12 N2 O2

IT 450408-24-9P 607739-27-5P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (polyamide compns. for porous polybenzoxazole dielec

. films for semiconductor devices)

RN 450408-24-9 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 405931-94-4 CMF C14 H6 C12 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

RN 607739-27-5 CAPLUS

CN 2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-diamino[1,1'-biphenyl]-4,4'-diol (9CI) (CA INDEX NAME)

CM 1

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CM 2

CRN 4194-40-5 CMF C12 H12 N2 O2

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IC
     ICM C08G069-44
     ICS C08G073-22; C08L067-02; C08L077-06; C08L077-10; C09D005-25;
          C09D171-00; C09D177-10; H01B003-00; H01B003-30; H01L021-312
CC
     38-3 (Plastics Fabrication and Uses)
     Section cross-reference(s): 76
ST
     polybenzoxazole dielec film semiconductor polyamide
     polyoxyalkylene; aminohydroxyphenyl fluoropropane
     phenylethynylisophthalate polyoxypropylene aminopropyl ethynylisophthalate
     film
IT
     Polybenzoxazoles
     RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (cardo; polyamide compns. for porous polybenzoxazole
        dielec. films for semiconductor devices)
IT
     Polybenzoxazoles
     RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (fluorine-containing; polyamide compns. for porous polybenzoxazole
        dielec. films for semiconductor devices)
TТ
     Polyoxyalkylenes, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-polyester-; polyamide compns. for porous
        polybenzoxazole dielec. films for semiconductor
        devices)
IT
     Polyesters, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-polyoxyalkylene-; polyamide compns. for porous
        polybenzoxazole dielec. films for semiconductor
        devices)
IT
     Dielectric films
     Semiconductor devices
        (polyamide compns. for porous polybenzoxazole dielec
        . films for semiconductor devices)
IT
     Polybenzoxazoles
     RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyamide compns. for porous polybenzoxazole dielec

    films for semiconductor devices)

IT
     Polyoxyalkylenes, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-; polyamide compns. for porous polybenzoxazole
        dielec. films for semiconductor devices)
IT
     Polyoxyalkylenes, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyester-; polyamide compns. for porous
        polybenzoxazole dielec. films for semiconductor
        devices)
```

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IT
     Polyesters, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyoxyalkylene-; polyamide compns. for porous
       polybenzoxazole dielec. films for semiconductor
       devices)
IT
    Fluoropolymers, uses
    RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; polyamide compns. for porous
       polybenzoxazole dielec. films for semiconductor
       devices)
IT
    Cardo polymers
    RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazoles; polyamide compns. for porous
       polybenzoxazole dielec. films for semiconductor
       devices)
IT
    Polyacetylenes, preparation
      Polyamides, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyester-polyoxyalkylene-; polyamide compns. for porous
       polybenzoxazole dielec. films for semiconductor
       devices)
IT
    Polyamides, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyoxyalkylene-; polyamide compns. for porous polybenzoxazole
       dielec. films for semiconductor devices)
    607739-28-6DP, thermally decomposed 607739-29-7DP, thermally
IT
    decomposed 607739-30-0DP, thermally decomposed 608095-70-1DP,
    Ethylene oxide-propylene oxide copolymer bis(2-aminopropyl)ether, polymer
    with 2,6-biphenylenedicarboxylic acid dichloride, 2,2-bis(3-amino-4-
    hydroxyphenyl) hexafluoropropane, and 4-ethynyl-2,6-naphthalenedicarboxylic
    acid dichloride, thermally decomposed 608137-80-0DP, thermally decomposed
    RL: DEV (Device component use); IMF (Industrial manufacture);
    TEM (Technical or engineered material use); PREP (Preparation);
    USES (Uses)
        (polyamide compns. for porous polybenzoxazole dielec
        . films for semiconductor devices)
    54667-43-5P 393543-15-2P 393543-26-5P
                                               450408-23-8P
TТ
                  607739-25-3P 607739-26-4P 607739-27-5P
    608095-69-8P, Ethylene oxide-propylene oxide copolymer
    bis(2-aminopropyl)ether, polymer with 2,6-Biphenylenedicarboxylic acid
    dichloride 608137-79-7P
                               608143-46-0P
                                               608143-81-3P
                                                             608143-83-5P
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP
     (Preparation); RACT (Reactant or reagent)
        (polyamide compns. for porous polybenzoxazole dielec
        . films for semiconductor devices)
L30 ANSWER 12 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
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ACCESSION NUMBER: 2003:715822 CAPLUS

DOCUMENT NUMBER: 139:246971

TITLE: Polyamide-based varnish compositions for insulating

films and semiconductor devices using them

INVENTOR(S): Saito, Hidenori; Enoki, Naoshi
PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 24 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

JP 2003257249 A2 20030912 JP 2002-54177 20020228

PRIORITY APPLN. INFO:: JP 2002-54177 20020228

AB The compns. contain a copolymer (C) prepared by reacting a polyamide (A) carboxyl, amino or/and hydroxyl groups with an reactive oligomer (B), and a surfactant, and provide microporous films with low

dielec. constant, good heat-resistant and mech. properties and water absorbency. Thus, reacting 93 g ethylene oxide-terminated polystyrene (preparation given) with 2.63 g 4-nitrobenzoyl chloride gave a polystyrene 4-aminobenzoate oligomer after reduction, 38.4 g of which was reacted with a copolymer prepared from 5.9 g 2.2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane and 27.7 g 4-ethynyl-2,6-naphthalenedicarboxylic chloride to give a C polymer, 20 g of which was further mixed with 1.5 g ethylene oxide-propylene oxide block copolymer in 100 g  $\gamma$ -lactone to give a varnish, which was coated on

an aluminum deposited silica wafer, heated to give a polybenzoxazole film.

IT 450408-24-9DP, reaction product with
4-aminobenzoate-terminated oligomers

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(in polyamide-based varnish compns. for insulating films and semiconductor devices using them)

RN 450408-24-9 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CRN 359642-31-2 CMF C37 H28 N2 O4

IC ICM H01B003-30

ICS C08G073-22; C08J005-18; C08L079-04; H01L021-312

CC 42-10 (Coatings, Inks, and Related Products)

Section cross-reference(s): 76

ST polyamide reactive oligomer varnish compn insulating film prepn; semiconductor device polybenzoxazole insulating film formation

IT Dielectric films

ii Diciootiio iiiiii

Varnishes

(fabrication of insulating films for semiconductor devices from reactive polyamide-based varnish compns.)

IT Polyamides, uses

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(fluorine- and hydroxy-containing, reaction product with 4-aminobenzoate-terminated oligomers; in polyamide-based varnish

```
compns. for insulating films and semiconductor devices using them)
ΙT
     Polyamides, uses
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (fluorine-containing; in polyamide-based varnish compns. for insulating
        films and semiconductor devices using them)
IT
     Fluoropolymers, uses
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyamide-, hydroxy-containing, reaction product with
        4-aminobenzoate-terminated oligomers; in polyamide-based varnish
        compns. for insulating films and semiconductor devices using them)
     Polyoxyalkylenes, uses
IT
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyamide-, reaction product with 4-aminobenzoate-terminated
        oligomers; in polyamide-based varnish compns. for insulating films and
        semiconductor devices using them)
IT
     Polybenzoxazoles
     RL: PEP (Physical, engineering or chemical process); PYP (Physical
     process); TEM (Technical or engineered material use); PROC (Process); USES
        (polyamide-; fabrication of insulating films for
        semiconductor devices from reactive polyamide-based varnish compns.)
ΙT
     Fluoropolymers, uses
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
    process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyamide-; in polyamide-based varnish compns. for insulating films
       and semiconductor devices using them)
IT
    Polyamides, uses
    RL: PEP (Physical, engineering or chemical process); PYP (Physical
    process); TEM (Technical or engineered material use); PROC (Process); USES
     (Uses)
        (polybenzoxazole-; fabrication of insulating films
        for semiconductor devices from reactive polyamide-based varnish
       compns.)
IT
    Polvamides, uses
    RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
    process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (polyoxyalkylene-, reaction product with 4-aminobenzoate-
```

terminated oligomers; in polyamide-based varnish compns. for insulating

films and semiconductor devices using them)

Semiconductor devices

IT

```
(using insulating films formed from reactive polyamide-based varnish
        compns.)
IT
     122-04-3DP, 4-Nitrobenzoyl chloride, reaction product with
     OH-terminated oligomers, and ethynyl-, amino-, and OH-containing
                 393543-10-7DP, reaction product with
     4-aminobenzoate-terminated oligomers 393543-15-2DP, reaction
     product with 4-aminobenzoate-terminated oligomers
                                                         445041-09-8DP,
     reaction product with 4-aminobenzoate-terminated oligomers
     450408-23-8DP, reaction product with 4-aminobenzoate-terminated
     oligomers 450408-24-9DP, reaction product with
     4-aminobenzoate-terminated oligomers
                                           457068-28-9DP, reaction
     product with 4-aminobenzoate-terminated oligomers
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or
     chemical process); POF (Polymer in formulation); PYP (Physical process);
     TEM (Technical or engineered material use); PREP (Preparation);
     PROC (Process); USES (Uses)
        (in polyamide-based varnish compns. for insulating films and
        semiconductor devices using them)
IT
     9003-13-8DP, Polypropylene glycol monobutyl ether, 4-aminobenzoate-
     terminated, reaction product with ethynyl-, amino-, and
     OH-containing polyamides
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
     process); POF (Polymer in formulation); PYP (Physical process); TEM
     (Technical or engineered material use); PREP (Preparation); PROC
     (Process); USES (Uses)
        (in reactive polyamide-based varnish compns. for insulating films and
        semiconductor devices using them)
     9003-53-6DP, Polystyrene, 4-aminobenzoate-terminated, reaction
IT
     product with ethynyl-, amino-, and OH-containing polyamides
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (in reactive polyamide-based varnish compns. for insulating films and
        semiconductor devices using them)
TΨ
     106392-12-5, Ethylene oxide-propylene oxide block copolymer
     RL: NUU (Other use, unclassified); USES (Uses)
        (surfactant; in polyamide-based varnish compns. for insulating films
        and semiconductor devices using them)
TТ
     7440-21-3, Silicon, miscellaneous
     RL: MSC (Miscellaneous)
        (wafer; fabrication of insulating films for semiconductor
        devices from reactive polyamide-based varnish compns.)
L30 ANSWER 13 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                        2003:671172 CAPLUS
DOCUMENT NUMBER:
                         139:198446
TITLE:
                         Porous polybenzoxazole films having
                         extremely low permittivity, their preparation
                         , and their use in semiconductor devices
INVENTOR (S):
                         Oki, Hiromi; Enoki, Naoshi
PATENT ASSIGNEE(S):
                         Sumitomo Bakelite Co., Ltd., Japan
SOURCE:
                         Jpn. Kokai Tokkyo Koho, 21 pp.
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CODEN: JKXXAF

DOCUMENT TYPE: Patent LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

APPLICATION NO. DATE PATENT NO. KIND DATE \_\_\_\_\_ -----JP 2003238724 A2 20030827 JP 2002-47120 20020222 JP 2002-47120 PRIORITY APPLN. INFO.: 20020222 Compns. for forming dielec. films of interlayer dielecs., protection films, solder resists, etc., contg.polyamides (A) involving repeating units represented by general formula [NHX (OH) 2NHCOYCO]n [X = divalent group selected from those derived from bisaminophenols such as 2,4-diaminoresorcinol, 2,2-bis(3-amino-4hydroxyphenyl) hexafluoropropane, 9,9-bis[4-[(4-amino-3hydroxy)phenoxy]phenyl]fluorene, etc.; Y = ≥1 of divalent group derived from dicarboxylic acids such as 3-ethynylphthalic acid, 2.2-bis(3-carboxy-4-ethynylphenyl)propane, 1,2-biphenylenedicarboxylic acid, 4,4'-tolandicarboxylic acid, isophthalic acid, 3,3'sulfonylbisbenzoic acid, etc.] and oligomers (B) , dissolved in 50-99.7% solvents (C), are formed into films by solvent casting method and exposed to vapors free form the solvents to remove the oligomers and to give fine pores in the films. Thus, polymerizing 37.7 g 9,9-bis[(4-amino-3hydroxy) phenyl] fluorene with 27.7 g 4-ethynyl-2,6-naphthalenedicarboxylic acid dichloride in the presence of Et3N gave a polyamide with Mw 24,900 and polydispersity 2.2, 3.1 g of which was dissolved in NMP together with 1.3 g polyoxypropylene with Mn 7500, filtered to give a varnish, spin-coated on Al vapor-deposited Si wafers, dried at 120°, exposed to vapor MeOH, and heated at 300° and O concentration ≤100 ppm to give polybenzoxazole films. The films were then heated at 400° to decompose oligomer units to give porous polybenzoxazole films, vapor-deposited with AL and patterned to give electrodes. The films showed permittivity at 1 MHz 2.1, Tg >450°, and contained ≤5-nm fine pores dispersed uniformly. 582294-71-1P 582294-72-2P 582294-74-4P IT RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process) (polyamide-oligomer copolymer; preparation of low-k porous polybenzoxazole films for semiconductor devices by solvent casting of polyamide-oligomer blends, followed with oligomer removal) RN 582294-71-1 CAPLUS 2.7-Biphenylenedicarbonyl dichloride, polymer with  $\alpha$ -(2-CN aminomethylethyl)  $-\omega$  (2-aminomethylethoxy) poly[oxy(methyl-1,2-

ethanediyl)] and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], block

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

(9CI) (CA INDEX NAME)

CRN 69417-81-8 CMF C14 H6 Cl2 O2

CM 3

CRN 9046-10-0 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$H_2N-CH_2-CH_2-O-CH_2-CH_2-CH_2-NH_2$$

2 ( D1-Me )

RN 582294-72-2 CAPLUS

CN Benzoyl chloride, 4,4'-(1,2-ethynediyl)bis-, polymer with  $\alpha$ -(2-aminomethylethyl)- $\omega$ -(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)] and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 2

CRN 16819-44-6 CMF C16 H8 C12 O2

CM 3

CRN 9046-10-0 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$H_2N-CH_2-CH_2-O$$
  $(C_3H_6)-O$   $CH_2-CH_2-NH_2$ 

2 (D1-Me)

RN 582294-74-4 CAPLUS

1,4-Benzenedicarbonyl dichloride, polymer with  $\alpha$ -(2-aminomethylethyl)- $\omega$ -(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)] and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 2

CRN 9046-10-0 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

2 (D1-Me)

CM 3

CRN 100-20-9 CMF C8 H4 C12 O2

IT 582294-65-3P 582294-67-5P 582294-68-6P,
9,9-Bis[(4-amino-3-hydroxy)phenyl]fluorene-4,4'-tolandicarboxylic acid
dichloride copolymer 582294-70-0P 582294-76-6P
582294-78-8P, 9,9-Bis[(4-amino-3-hydroxy)phenyl]fluorene-4,4'tolandicarboxylic acid dichloride copolymer, sru 582294-79-9P
RL: DEV (Device component use); IMF (Industrial manufacture);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
 (preparation of low-k porous polybenzoxazole films for
 semiconductor devices by solvent casting of polyamide-oligomer blends,

followed with oligomer removal)
RN 582294-65-3 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CRN 152480-72-3 CMF C25 H20 N2 O2

RN 582294-67-5 CAPLUS CN 2,7-Biphenylenedicarbonyl dichloride, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

CRN 69417-81-8 CMF C14 H6 Cl2 O2

RN 582294-68-6 CAPLUS

CN Benzoyl chloride, 4,4'-(1,2-ethynediyl)bis-, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

CRN 16819-44-6 CMF C16 H8 Cl2 O2

$$c1-c$$

$$0$$

$$c=c$$

$$0$$

$$0$$

$$0$$

RN 582294-70-0 CAPLUS

CN 1,4-Benzenedicarbonyl dichloride, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

CRN 100-20-9 CMF C8 H4 Cl2 O2

CN

RN 582294-76-6 CAPLUS

Poly[iminocarbonyl-2,7-biphenylenediylcarbonylimino(2-hydroxy-1,4-phenylene)-9H-fluoren-9-ylidene(3-hydroxy-1,4-phenylene)] (9CI) (CA INDEX NAME)

RN 582294-78-8 CAPLUS
CN Poly[imino(2-hydroxy-1,4-phenylene)-9H-fluoren-9-ylidene(3-hydroxy-1,4-phenylene)iminocarbonyl-1,4-phenylene-1,2-ethynediyl-1,4-phenylenecarbonyl] (9CI) (CA INDEX NAME)

RN 582294-79-9 CAPLUS

CN Poly[iminocarbonyl-1,4-phenylenecarbonylimino(2-hydroxy-1,4-phenylene)-9H-fluoren-9-ylidene(3-hydroxy-1,4-phenylene)] (9CI) (CA INDEX NAME)

IC ICM C08J009-04

ICS C08G069-32; H01L021-312; C08L077-06

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 74, 76

ST polybenzoxazole porous film low permittivity prepn;
polyamide cyclization condensation polybenzoxazole prepn
oligomer pyrolysis; polyoxyalkylene oligomer polyamide soln solvent
casting; semiconductor device polybenzoxazole dielec
film

IT Polyoxyalkylenes, uses

RL: NUU (Other use, unclassified); USES (Uses)
(oligomer; preparation of low-k porous polybenzoxazole
films for semiconductor devices by solvent casting of
polyamide-oligomer blends, followed with oligomer removal)

IT Polyoxyalkylenes, processes
 RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PREP (Preparation); PROC (Process)
 (polyamide-, block, polyamide-oligomer copolymer; preparation of
 low-k porous polybenzoxazole films for semiconductor devices
 by solvent casting of polyamide-oligomer blends, followed with oligomer

removal)
IT Polyamides, processes

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process) (polyoxyalkylene-, block, polyamide-oligomer copolymer; prepn . of low-k porous polybenzoxazole films for semiconductor devices by solvent casting of polyamide-oligomer blends, followed with oligomer removal)

IT Dielectric films

Semiconductor devices

(preparation of low-k porous polybenzoxazole films for semiconductor devices by solvent casting of polyamide-oligomer blends, followed with oligomer removal)

```
IT
     Polyoxyalkylenes, processes
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); PYP (Physical process); REM (Removal or disposal); PROC
     (Process)
        (preparation of low-k porous polybenzoxazole films for
        semiconductor devices by solvent casting of polyamide-oligomer blends,
        followed with oligomer removal)
IT
     Polybenzoxazoles
     RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (preparation of low-k porous polybenzoxazole films for
        semiconductor devices by solvent casting of polyamide-oligomer blends,
        followed with oligomer removal)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (preparation of low-k porous polybenzoxazole films for
        semiconductor devices by solvent casting of polyamide-oligomer blends,
        followed with oligomer removal)
     9046-10-0, Polypropylene glycol bis(2-aminopropyl ether)
IT
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); PYP (Physical process); REM (Removal or disposal); PROC
     (Process)
        (oligomer; preparation of low-k porous polybenzoxazole
        films for semiconductor devices by solvent casting of
        polyamide-oligomer blends, followed with oligomer removal)
IT
     25322-69-4
     RL: NUU (Other use, unclassified); USES (Uses)
        (oligomer; preparation of low-k porous polybenzoxazole
        films for semiconductor devices by solvent casting of
        polyamide-oligomer blends, followed with oligomer removal)
     582294-71-1P 582294-72-2P 582294-73-3P
IT
     582294-74-4P
     RL: IMF (Industrial manufacture); PEP (Physical, engineering or
     chemical process); PYP (Physical process); PREP (Preparation);
     PROC (Process)
        (polyamide-oligomer copolymer; preparation of low-k porous
        polybenzoxazole films for semiconductor devices by solvent
        casting of polyamide-oligomer blends, followed with oligomer removal)
     582294-65-3P 582294-66-4P, 4,4'-Diamino-3,3'-dihydroxydiphenyl
ΤТ
     ether-5-phenylethynylisophthalic acid dichloride copolymer
     582294-67-5P 582294-68-6P, 9,9-Bis[(4-amino-3-
     hydroxy)phenyl]fluorene-4,4'-tolandicarboxylic acid dichloride copolymer
     582294-69-7P 582294-70-0P 582294-75-5P, 4,4'-Diamino-3,3'-
     dihydroxydiphenyl ether-5-phenylethynylisophthalic acid dichloride
     copolymer, sru 582294-76-6P 582294-78-8P,
     9,9-Bis[(4-amino-3-hydroxy)phenyl]fluorene-4,4'-tolandicarboxylic acid
     dichloride copolymer, sru 582294-79-9P 583032-41-1P
     RL: DEV (Device component use); IMF (Industrial manufacture);
     TEM (Technical or engineered material use); PREP (Preparation);
     USES (Uses)
         (preparation of low-k porous polybenzoxazole films for
```

followed with oligomer removal)

```
9003-11-6, Ethylene oxide-propylene oxide copolymer
IT
    RL: NUU (Other use, unclassified); USES (Uses)
        (preparation of low-k porous polybenzoxazole films for
        semiconductor devices by solvent casting of polyamide-oligomer blends,
        followed with oligomer removal)
    64-17-5, Ethanol, uses 67-56-1, Methanol, uses
IT
    RL: NUU (Other use, unclassified); USES (Uses)
        (preparation of low-k porous polybenzoxazole films for
        semiconductor devices by solvent casting of polyamide-oligomer blends,
        followed with oligomer removal by exposure to vapor of)
L30 ANSWER 14 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                       2003:671152 CAPLUS
ACCESSION NUMBER:
                        139:189377
DOCUMENT NUMBER:
                        Heat-resistant
TITLE:
                        polybenzoxazole precursors with excellent
                        moldability, polybenzoxazoles, and
                        dielectric materials and semiconductor devices
                        using them
                        Ishida, Yuichi; Enoki, Naoshi
INVENTOR (S):
                        Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 10 pp.
SOURCE:
                        CODEN: JKXXAF
DOCUMENT TYPE:
                        Patent
                        Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                        APPLICATION NO. DATE
                 KIND DATE
     PATENT NO.
     -----
                                         _____
     JP 2003238685 A2 20030827
                                        JP 2002-40743 20020218
                                      JP 2002-40743
                                                         20020218
PRIORITY APPLN. INFO.:
   The precursors, showing good solubility in organic solvents, have units
     [NHX(OH)2NHC:OYC:O]m[NHX(OH)2NHC:OZC:O]n [X = tetravalent aromatic group; Y =
     O1002C.tplbond.CX2; Q1 = benzenetriyl; Q2 = phenylene; X2 = H, aryl, aromatic
     group; Z = divalent aromatic group; m > 0; n \ge 0; m + n = 2-1000; m/(m + 1)
     n) = 0.5-1.
     581106-84-5P 581106-85-6P
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (crosslinked; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
     581106-84-5 CAPLUS
RN
     1,3-Benzenedicarbonyl dichloride, 5-[4-(phenylethynyl)phenoxy]-, polymer
CN
     with 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)
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semiconductor devices by solvent casting of polyamide-oligomer blends,

CM 1

CRN 432026-03-4 CMF C22 H12 Cl2 O3

CM 2

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 581106-85-6 CAPLUS
CN Poly[iminocarbonyl[5-[4-(phenylethynyl)phenoxy]-1,3phenylene]carbonylimino(6-hydroxy-1,3-phenylene)-9H-fluoren-9-ylidene(4hydroxy-1,3-phenylene)] (9CI) (CA INDEX NAME)

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ICM C08G073-22
IC
     ICS C08J005-18; H01L021-312; C08L079-08
    76-3 (Electric Phenomena)
CC
     Section cross-reference(s): 38
    heat resistance polybenzoxazole precursor
ST
     interlayer dielec; polybenzoxazole precursor
     ethynylphenoxy group crosslinking semiconductor; semiconductor device
     phenylethynylphenoxyisophthalic polybenzoxazole precursor soly
     Polyamides, preparation
ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (aromatic, fluorine- and hydroxy-containing, precursors; heat-
        resistant polybenzoxazole precursors having
        ethynylphenoxy groups with good solubility in organic solvents for
        dielec. films for semiconductor devices)
     Polyamides, preparation
тт
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (aromatic, hydroxy-containing, precursors; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (crosslinked; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
     Heat-resistant materials
IT
        (films; heat-resistant polybenzoxazole
        precursors having ethynylphenoxy groups with good solubility in organic
        solvents for dielec. films for semiconductor devices)
тΨ
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (fluorine-containing, crosslinked; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
     Dielectric films
IT
     Semiconductor devices
        (heat-resistant polybenzoxazole
        precursors having ethynylphenoxy groups with good solubility in organic
        solvents for dielec. films for semiconductor devices)
тт
     Films
         (heat-resistant; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
     Fluoropolymers, preparation
IT
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TT

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RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-, aromatic, hydroxy-containing, precursors; heat-
        resistant polybenzoxazole precursors having
        ethynylphenoxy groups with good solubility in organic solvents for
        dielec. films for semiconductor devices)
IT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-, hydroxy-containing, aromatic, precursors; heat-
        resistant polybenzoxazole precursors having
        ethynylphenoxy groups with good solubility in organic solvents for
        dielec. films for semiconductor devices)
     Fluoropolymers, properties
IT
     Polyethers, properties
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, crosslinked; heat-
        resistant polybenzoxazole precursors having
        ethynylphenoxy groups with good solubility in organic solvents for
        dielec. films for semiconductor devices)
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyether-, crosslinked; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
ΤТ
     Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-, hydroxy-containing, aromatic, precursors; heat-
        resistant polybenzoxazole precursors having
        ethynylphenoxy groups with good solubility in organic solvents for
        dielec. films for semiconductor devices)
IT
     581106-78-7P, 3,3'-Diamino-4,4'-dihydroxybiphenyl-5-[4-(2-
     phenylethynyl) phenoxy} isophthalic dichloride copolymer
                                                              581106-79-8P
     581106-80-1P
                    581106-81-2P 581106-82-3P 581106-83-4P
     581106-84-5P 581106-85-6P
                                 581106-86-7P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
        (crosslinked; heat-resistant
        polybenzoxazole precursors having ethynylphenoxy groups with
        good solubility in organic solvents for dielec. films for
        semiconductor devices)
L30 ANSWER 15 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                        2003:559934 CAPLUS
DOCUMENT NUMBER:
                        139:118392
TITLE:
                        Electrically insulating coating varnishes,
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and electric insulator films and

...) F

```
semiconductor devices using them
                         Ishikawa, Tadahiro; Saito, Hidenori; Murayama,
INVENTOR (S):
                         Kazumoto
                         Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
SOURCE:
                         Jpn. Kokai Tokkyo Koho, 27 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:
                        Patent
                         Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
     PATENT NO.
                    KIND DATE
                                         APPLICATION NO. DATE
     -----
                                          -----
     JP 2003206441
                     A2 20030722
                                          JP 2002-280028
                                                          20020925
PRIORITY APPLN. INFO.:
                                      JP 2001-294864 A 20010926
   The coating varnishes contain (A) copolymers prepared by reaction
     of polyamides having repeating units
     [NHX(OR1)(OR2)NHCOY1CO]m[NHX(OR3)(OR4)NHCOY2CO]n[m > 0; n > 0; 2
     \leq m + n \leq 1000; 0.05 \leq m/(m + n) \leq 1; R1-R4 =
     H, monovalent organic group; X = aromatic tetravalent group; Y1 = acetylenic
     group-containing divalent group, biphenylenediyl; Y2 = divalent group] with
     reactive oligomers having substituents reactive towards carboxyl, amino,
     or hydroxy groups of the polyamides, (B) acetylenes, and (C)
     organic solvents. Thus, 2.94 mmol 2,2-bis(3-amino-4-
     hydroxyphenyl) hexafluoropropane was polymerized with 3.0 mmol
     2-phenylethynylterephthaloyl chloride in N-methyl-2-pyrrolidone in the
     presence of Et3N and the reaction product was condensed with
     0.12 mmol 4-aminobenzoate ester-terminated styrene oligomer in
     y-butyrolactone to give a copolymer having Mw 20,000 and Mw/Mn 2.22.
     A varnish containing the copolymer 1.0, 4,4'-bis(phenylethynyl)biphenyl (
     preparation given) 0.2, and cyclohexanone 8.8 g was applied on a Si
     wafer and heated at 100° for 30 min, at 200° for 30 min, and
     at 400° for 1 h to form a 1.23-um film showing dielec.
     constant 2.2, 5% weight-loss temperature 521°, Tg >450°, elastic
     modulus 5 GPa, and ≤10-nm fine pores.
     562870-49-9P 562870-51-3P 562870-53-5P
TT
     562870-54-6P 562870-55-7P 562870-56-8P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
        (benzoxazole ring-containing; coating varnishes containing OH- and
acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     562870-49-9 CAPLUS
RN
     1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with
CN
     \alpha-(2-aminopropyl)-\omega-(2-aminopropoxy)poly[oxy(methyl-1,2-
     ethanediyl)], 4,4'-bis(phenylethynyl)-1,1'-biphenyl and
     4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)
     CM
         1
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CRN 393543-05-0 CMF C10 H4 C12 O2

CM 2

CRN 53304-21-5 CMF C28 H18

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 4

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 562870-51-3 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and 1,3,5-tris(phenylethynyl)benzene (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 2

CRN 118688-56-5 CMF C30 H18

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & \begin{array}{c} & \text{NH}_2 \\ \end{array} \\ \text{(C}_3\text{H}_6) - \text{O} & \begin{array}{c} & \text{NH}_2 \\ \end{array} \\ \end{array}$$

CM 4

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 562870-53-5 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,4-bis(phenylethynyl)benzene and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM :

CN

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CRN 26403-64-5

CMF (C3 H6 O)n C6 H16 N2 O

CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & \begin{array}{c} & \text{NH}_2 \\ & \text{C}_3 \text{H}_6 \end{array}) - \text{O} \\ & \begin{array}{c} \text{N}_{12} \\ \text{N}_{23} \end{array} \end{array}$$

CM 3

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 4

CRN 1849-27-0 CMF C22 H14

RN 562870-54-6 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with α-(2-aminopropyl)-ω-(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,4-bis(phenylethynyl)naphthalene and 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA INDEX NAME)

CM 1

CRN 73888-61-6 CMF C26 H16

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 4

CRN 2373-98-0 CMF C12 H12 N2 O2

RN 562870-55-7 CAPLUS

CN 2,7-Biphenylenedicarbonyl dichloride, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)],

1,4-bis(phenylethynyl)benzene, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 5-ethynyl-1,3-benzenedicarbonyl dichloride (9CI) (CA INDEX NAME)

CM :

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 69417-81-8 CMF C14 H6 C12 O2

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CRN 2373-98-0 CMF C12 H12 N2 O2

CM 5

CRN 1849-27-0 CMF C22 H14

$$C = C - bh$$

RN 562870-56-8 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,4-benzenedicarbonyl dichloride, 1,4-bis(phenylethynyl)naphthalene, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 C12 O2

CRN 73888-61-6 CMF C26 H16

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 4

CRN 20638-07-7 CMF C25 H20 N2 O2

CRN 2373-98-0 CMF C12 H12 N2 O2

CM (

CRN 100-20-9 CMF C8 H4 Cl2 O2

IT 562870-40-0P 562870-44-4P 562870-45-5P

562870-46-6P 562870-47-7P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses) (coating varnishes containing OH- and acetylenic group-containing

(coating varnishes containing OH- and acetylenic group-containing polyamides and acetylenes for nanoporous dielec. crosslinked polybenzoxazole films and semiconductor devices)

RN 562870-40-0 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy) poly[oxy(methyl-1,2-ethanediyl)] and 4,4'-(9H-fluoren-9-ylidene) bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM · 1

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 3

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 562870-44-4 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with
4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and 2-oxepanone, block (9CI)
(CA INDEX NAME)

CM :

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 502-44-3 CMF C6 H10 O2

CN

RN 562870-45-5 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and (1-methylethenyl)benzene, block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 98-83-9

CMF C9 H10

RN 562870-46-6 CAPLUS

CN 2,7-Biphenylenedicarbonyl dichloride, polymer with  $\alpha$ -(2-aminopropyl)-

 $_{\odot}$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)],

4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 5-ethynyl-1,3-benzenedicarbonyl dichloride, block (9CI) (CA INDEX NAME)

CM :

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 69417-81-8 CMF C14 H6 Cl2 O2

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

Me-CH-CH<sub>2</sub>-O-
$$(C_3H_6)$$
-O- $n$ -CH<sub>2</sub>-CH-Me

CM 4

CRN 2373-98-0 CMF C12 H12 N2 O2

RN 562870-47-7 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropxy) poly [oxy (methyl-1,2-ethanediyl)], 1,4-benzenedicarbonyl dichloride, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 393543-05-0 CMF C10 H4 Cl2 O2

$$\begin{array}{c} O \\ C1-C \\ C-C1 \\ C \\ O \end{array}$$

CM 2

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & ---- & \text{(C}_3\text{H}_6\text{)} - \text{O} & ---- \\ \end{array} \\ \text{n} & \text{CH}_2 - \text{CH-Me} \\ \end{array}$$

CM 3

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 4

CRN 2373-98-0 CMF C12 H12 N2 O2

CM 5

CRN 100-20-9 CMF C8 H4 C12 O2

IC ICM C09D179-04

ICS C08G073-22; C09D005-25; C09D201-02; H01B003-30; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 37, 42, 76

ST coating varnish dielec acetylene polyamide semiconductor; elec insulator film polyamide acetylene polybenzoxazole;

heat resistance dielec film acetylene

polybenzoxazole; nanoporous dielec film acetylene polybenzoxazole semiconductor

IT Crosslinking agents

(acetylenes; coating varnishes containing OH- and acetylenic group-containing

polyamides and acetylenes for nanoporous dielec.

crosslinked polybenzoxazole films and semiconductor devices)

IT Polyamides, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(block, cardo, poly(methylstyrene)-; coating varnishes containing OH- and acetylenic group-containing polyamides and acetylenes for

nanoporous dielec. crosslinked polybenzoxazole

films and semiconductor devices)

IT Semiconductor devices

Varnishes

(coating varnishes containing OH- and acetylenic group-containing polyamides and acetylenes for nanoporous dielec. crosslinked polybenzoxazole films and semiconductor devices)

IT Alkynes

RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(crosslinking agents; coating varnishes containing OH- and acetylenic group-containing polyamides and acetylenes for nanoporous dielec. crosslinked polybenzoxazole films and

IT Heat-resistant materials

semiconductor devices)

(dielec.; coating varnishes containing OH- and acetylenic group-containing polyamides and acetylenes for nanoporous dielec. crosslinked polybenzoxazole films and semiconductor devices)

IT Polyamides, uses

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RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (fluorine-containing, block, polystyrene-; coating varnishes containing OH-
and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Electric insulators
IT
        (heat-resistant; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
TТ
     Dielectric films
        (nanoporous; coating varnishes containing OH- and acetylenic
group-containing
        polyamides and acetylenes for nanoporous dielec.
        crosslinked polybenzoxazole films and semiconductor devices)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-, cardo; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Polvamides, uses
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyacetylene-, fluorine-containing, block, polystyrene- or poly(Me
        methacrylate) -; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-, fluorine-containing; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Fluoropolymers, uses
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyacetylene-polyamide-, block, polystyrene- or poly(Me
        methacrylate) -; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Polyesters, uses
тт
     Polyoxyalkylenes, uses
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Polyurethanes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-, cardo; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-, fluorine-containing; coating
        varnishes containing OH- and acetylenic group-containing polyamides
        and acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Fluoropolymers, uses
     Polyesters, uses
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-; coating varnishes containing OH-
        and acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Polyethers, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyester-; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Cardo polymers
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyesters; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Polyesters, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyether-; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Fluoropolymers, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyoxyalkylene-; coating
        varnishes containing OH- and acetylenic group-containing polyamides
        and acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
    Cardo polymers
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IT

IT

IT

TТ

IT

IT

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RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyoxyalkylenes; coating
       varnishes containing OH- and acetylenic group-containing polyamides
       and acetylenes for nanoporous dielec. crosslinked
       polybenzoxazole films and semiconductor devices)
IT
    Cardo polymers
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazole-polyurethanes; coating
       varnishes containing OH- and acetylenic group-containing polyamides
       and acetylenes for nanoporous dielec. crosslinked
       polybenzoxazole films and semiconductor devices)
    Cardo polymers
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polybenzoxazoles; coating varnishes containing OH-
       and acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyester-, cardo; coating varnishes containing OH- and
       acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyester-; coating varnishes containing OH- and acetylenic
       group-containing polyamides and acetylenes for nanoporous
       dielec. crosslinked polybenzoxazole films and
       semiconductor devices)
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyester-polyether-; coating varnishes containing OH- and
       acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec, crosslinked polybenzoxazole
       films and semiconductor devices)
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyoxyalkylene-, cardo; coating varnishes containing OH-
       and acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec, crosslinked polybenzoxazole
       films and semiconductor devices)
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
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(polyacetylene-polyoxyalkylene-, fluorine-containing; coating varnishes

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containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyoxyalkylene-; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyacetylene-polyurethane-, cardo; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polyesters, uses
IΤ
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-, block, cardo; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Fluoropolymers, uses
IΤ
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-, block, polystyrene-; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polyesters, uses
IT
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-, block; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Polyurethanes, uses
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-, cardo; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Polyacetylenes, uses
TT
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RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
      (Reactant); TEM (Technical or engineered material use); PREP (Preparation)
      ; RACT (Reactant or reagent); USES (Uses)
         (polyamide-, fluorine-containing, block, polystyrene- or poly(Me
        methacrylate) -; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
IT
     Polyoxyalkylenes, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
      (Reactant); TEM (Technical or engineered material use); PREP
      (Preparation); RACT (Reactant or reagent); USES (Uses)
         (polyamide-, fluorine-containing, block; coating varnishes containing OH-
and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
ΙT
     Polyethers, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyester-, block; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Cardo polymers
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyesters, block; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Polyesters, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyether-, block; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Fluoropolymers, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyoxyalkylene-, block; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
    Cardo polymers
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
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(Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyoxyalkylenes, block; coating varnishes containing OH- and
       acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
    Cardo polymers
IT
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyurethanes; coating varnishes containing OH- and acetylenic
       group-containing polyamides and acetylenes for nanoporous
       dielec, crosslinked polybenzoxazole films and
       semiconductor devices)
IT
    Cardo polymers
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamides, block, poly(methylstyrene) -; coating varnishes
       containing OH- and acetylenic group-containing polyamides and
       acetylenes for nanoporous dielec. crosslinked
       polybenzoxazole films and semiconductor devices)
     Polyacetylenes, uses
IT
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, cardo; coating varnishes containing OH- and
       acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polyacetylenes, uses
IT
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, fluorine-containing; coating varnishes containing
       OH- and acetylenic group-containing polyamides and acetylenes for
       nanoporous dielec, crosslinked polybenzoxazole
        films and semiconductor devices)
IT
    Polyacetylenes, uses
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyester-, cardo; coating varnishes containing
       OH- and acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Polyacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyester-; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Polvacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
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(polybenzoxazole-polyester-polyether-; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Polyacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-, cardo; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Polyacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-, fluorine-containing; coating
        varnishes containing OH- and acetylenic group-containing polyamides
        and acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
ΙT
     Polyacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyoxyalkylene-; coating varnishes containing
        OH- and acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
IT
     Polyacetylenes, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyurethane-, cardo; coating varnishes
        containing OH- and acetylenic group-containing polyamides and
        acetylenes for nanoporous dielec. crosslinked
        polybenzoxazole films and semiconductor devices)
IT
     Polvamides, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyester-, block, cardo; coating varnishes containing OH- and acetylenic
       group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
TΥ
    Polyamides, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use): PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyester-, block; coating varnishes containing OH- and acetylenic
       group-containing polyamides and acetylenes for nanoporous
       dielec. crosslinked polybenzoxazole films and
       semiconductor devices)
IT
    Polyamides, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation): RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
```

```
(polyester-polyether-, block; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
TΤ
     Polyamides, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP (Preparation)
     ; RACT (Reactant or reagent); USES (Uses)
        (polyoxyalkylene-, block, cardo; coating varnishes containing OH- and
        acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polyamides, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyoxyalkylene-, block; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
     Polyamides, uses
ΙT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyoxyalkylene-, fluorine-containing, block; coating varnishes containing
OH-
        and acetylenic group-containing polyamides and acetylenes for
        nanoporous dielec. crosslinked polybenzoxazole
        films and semiconductor devices)
     Polvamides, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyurethane-, cardo; coating varnishes containing OH- and acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
יייד
     562870-48-8P 562870-49-9P
                                 562870-50-2P 562870-51-3P
     562870-52-4P 562870-53-5P 562870-54-6P
     562870-55-7P 562870-56-8P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (benzoxazole ring-containing; coating varnishes containing OH- and
acetylenic
        group-containing polyamides and acetylenes for nanoporous
        dielec. crosslinked polybenzoxazole films and
        semiconductor devices)
    4194-40-5DP, 3,3'-Diamino-4,4'-dihydroxybiphenyl, polymers with
IΤ
    phenylethynylisophthaloyl chloride and aminobenzoate-terminated ester
     oligomer or ether-ester oligomer, block
                                              20638-07-7DP.
     9,9-Bis[(3-amino-4-hydroxy)phenyl]fluorene, polymers with
```

```
phenylethynylterephthaloyl chloride and urethane oligomer 393543-14-1DP,
     polymers with diaminodihydroxybiphenyl and aminobenzoate-terminated ester
     oligomer or ether-ester oligomer, block 562870-37-5DP, polymers with
     bis[(aminohydroxy)phenyl]fluorene and urethane oligomer 562870-38-6P,
     2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-2-
     phenylethynylterephthaloyl chloride-styrene block copolymer
                                                                  562870-39-7P
     562870-40-0P 562870-41-1P 562870-42-2P 562870-43-3P
     562870-44-4P 562870-45-5P 562870-46-6P
     562870-47-7P
     RL: IMF (Industrial manufacture); POF (Polymer in formulation);
     RCT (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (coating varnishes containing OH- and acetylenic group-containing
        polyamides and acetylenes for nanoporous dielec.
        crosslinked polybenzoxazole films and semiconductor devices)
IΤ
     1849-27-0P, 1,4-Bis (phenylethynyl) benzene 53304-21-5P,
     4,4'-Bis(phenylethynyl)biphenyl 73888-61-6P
     1,3,5-Tris(phenylethynyl)benzene 478070-32-5P
     RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
     engineered material use); PREP (Preparation); RACT (Reactant or reagent);
     USES (Uses)
        (coating varnishes containing OH- and acetylenic group-containing
       polyamides and acetylenes for nanoporous dielec.
       crosslinked polybenzoxazole films and semiconductor devices)
TΤ
     83-53-4, 1,4-Dibromonaphthalene 92-86-4, 4,4'-Dibromobiphenvl
     106-37-6, 1,4-Dibromobenzene 536-74-3, Ethynylbenzene
     1,3,5-Tribromobenzene 16400-50-3, 3,3',5,5'-Tetrabromobiphenyl
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (coating varnishes containing OH- and acetylenic group-containing
       polyamides and acetylenes for nanoporous dielec.
        crosslinked polybenzoxazole films and semiconductor devices)
L30 ANSWER 16 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                       2003:479017 CAPLUS
DOCUMENT NUMBER:
                        139:61281
TITLE:
                        Storage-stable materials and coating varnishes for
                        electrically insulating films and
                        semiconductor devices
INVENTOR(S):
                        Oki, Hiromi; Saito, Hidenori; Enoki, Naoshi
PATENT ASSIGNEE(S):
                       Sumitomo Bakelite Co., Ltd., Japan
SOURCE:
                        Jpn. Kokai Tokkyo Koho, 25 pp.
                        CODEN: JKXXAF
DOCUMENT TYPE:
                        Patent
LANGUAGE:
                        Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
     PATENT NO.
                    KIND DATE
                                         APPLICATION NO. DATE
     ----- ----
                          -----
    JP 2003176352
                     A2 20030624
                                         JP 2001-377448 20011211
PRIORITY APPLN. INFO.:
                                       JP 2001-377448
                                                        20011211
    The materials contain copolymers prepared from (A)
```

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polyamides [NHX1NHC(:O)YC(:O)]m[NHX2NHC(:O)YC(:O)]n [I; X1 =
     divalent group selected from structures described in the document; X2 =
     isomer of X1; Y = ≥1 divalent groups selected from structures
     described in the document; m, n > 0; m + n = 2 - 1000; m/(m + n) = 0.05 - 0.5
     and (B) oligomers having reactive groups for CO2H, amino, or OH groups in
     I. The varnishes comprise the above materials and organic solvents. The
     insulating films are obtained by heating the materials or the varnishes
     for condensation and crosslinking to give polybenzoxazole-based
     layers having fine cells. The semiconductor devices have the insulating
     films as multilayer wirings or surface-protective films. The films show
     good heat and water resistance and low dielec. constant
IT
     545446-42-2DP, 9,9-Bis(3-amino-4-hydroxyphenyl)fluorene-9,9-Bis(4-
     amino-3-hydroxyphenyl)fluorene-4-ethynyl-2,6-naphthalenedicarboxylic
     dichloride copolymer, reaction products with
     aminobenzoate-terminated styrene oligomers, pyrolyzed
     545446-50-2DP, reaction products with ethylene
     oxide-propylene oxide block oligomer, pyrolyzed 545446-51-3DP,
     reaction products with ethylene oxide-propylene oxide block
     oligomer, pyrolyzed 628726-00-1P 628726-56-7P
     628727-03-7P 628727-07-1P 628727-40-2P
     628727-85-5P
     RL: DEV (Device component use); IMF (Industrial manufacture);
     TEM (Technical or engineered material use); PREP (Preparation);
     USES (Uses)
        (storage-stable varnishes for polybenzoxazole-based
        elec. insulating films in semiconductors)
RN
     545446-42-2 CAPLUS
CN
     2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with
     3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-
     ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)
     CM
          1
     CRN 405931-94-4
     CMF C14 H6 C12 O2
```

CM :

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 545446-50-2 CAPLUS CN [1,1'-Biphenyl]-4,4'

[1,1'-Biphenyl]-4,4'-dicarbonyl dichloride, 2,2'-bis(phenylethynyl)-, polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393543-08-3 CMF C30 H16 Cl2 O2

CRN 152480-72-3 CMF C25 H20 N2 O2

CM :

RN 545446-51-3 CAPLUS
CN [1,1'-Biphenyl]-4,4'-dicarbonyl dichloride, 2,2'-bis(naphthalenylethynyl), polymer with 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and
4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393588-30-2 CMF C38 H20 Cl2 O2 CCI IDS

CM 2

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 628726-00-1 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha\text{-}(2\text{-aminopropyl})-\omega\text{-}(2\text{-aminopropoxy})\,\text{poly}[\text{oxy}(\text{methyl-1,2-ethanediyl})]$ , 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & \begin{array}{c} & \text{NH}_2 \\ \text{($C_3$H}_6$)} - \text{O} \\ \end{array} \\ & \begin{array}{c} \text{NH}_2 \\ \text{CH}_2 - \text{CH-Me} \end{array}$$

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 628726-56-7 CAPLUS CN 2.6-Naphthalenedicar

2,6-Naphthalenedicarbonyl dichloride, polymer with  $\alpha$ -(4-aminobenzoyl)- $\omega$ -[(4-aminobenzoyl)oxy]poly[oxy(methyl-1,2-ethanediyl)], 5-ethynyl-1,3-benzenedicarbonyl dichloride, 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 77450-83-0 CMF (C3 H6 O)n C14 H12 N2 O3 CCI IDS, PMS

$$\begin{array}{c|c} H_2N & O & O & O \\ \hline & C & -C & C_3H_6 \\ \hline \end{array}$$

CM 4

CRN 2351-36-2 CMF C12 H6 C12 O2

RN 628727-03-7 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-(phenylethynyl)-, polymer with α-(2-aminopropyl)-ω-(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1 CMF C16 H8 Cl2 O2

CM 2

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & \begin{array}{c} & \text{NH}_2 \\ \text{C}_3 \text{H}_6 \end{array}) - \text{O} & \begin{array}{c} & \text{NH}_2 \\ \text{C}_4 - \text{CH-Me} \end{array}$$

CM 4

RN 628727-07-1 CAPLUS

CN 2,7-Biphenylenedicarbonyl dichloride, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)],

%-(2-authopropoxy)pory(toxy(methyf=1,2-ethanedryf)],
3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 2

CRN 69417-81-8 CMF C14 H6 Cl2 O2

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 628727-40-2 CAPLUS CN Benzoyl chloride, 4,4'-(1,2-ethynediyl)bis-, polymer with  $\alpha$ -(2-aminopropyl)- $_0$ -(2-aminopropoxy)poly[oxy(methyl-1,2-

tallianing to the second of th

CM 1

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

CM 3

CRN 16819-44-6 CMF C16 H8 Cl2 O2

RN 628727-85-5 CAPLUS

[1,1'-Biphenyl]-4,4'-dicarbonyl dichloride, 2,2'-bis(phenylethynyl)-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,3-benzenedicarbonyl dichloride, 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 393543-08-3 CMF C30 H16 Cl2 O2

CM 2

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH}_2 & \text{NH}_2 \\ \text{Me-CH-CH}_2 - \text{O} & & & \\ \end{array} \\ \text{Me-CH-CH}_2 - \text{O} & & & \\ \end{array}$$

CM 4

CRN 99-63-8

CMF C8 H4 Cl2 O2

IC ICM C08G069-48

ICS C08G073-22; C09D005-25; C09D177-06; C09D201-02; H01B003-30

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

ST polyamide varnish storage stability insulating film; heat resistance polybenzoxazole insulating film semiconductor; water resistance polybenzoxazole insulating film semiconductor; dielec const polybenzoxazole insulating film semiconductor

IT Polybenzoxazoles

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (cardo; storage-stable varnishes for polybenzoxazole-based

elec. insulating films in semiconductors)

IT Heat-resistant materials

Water-resistant materials

(films; storage-stable varnishes for polybenzoxazole-based elec. insulating films in semiconductors)

IT Films

(heat-resistant; storage-stable varnishes for polybenzoxazole-based elec. insulating films in semiconductors)

IT Polyesters, reactions

Polyoxyalkylenes, reactions

Polyurethanes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(oligomeric; storage-stable varnishes for polybenzoxazole

-based elec. insulating films in semiconductors)

IT Cardo polymers

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polybenzoxazoles; storage-stable varnishes for polybenzoxazole-based elec. insulating films in

semiconductors)

IT Polysulfones, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(polyether-, oligomeric; storage-stable varnishes for
polybenzoxazole-based elec. insulating films in

```
semiconductors)
IT
    Polyethers, reactions
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (polysulfone-, oligomeric; storage-stable varnishes for
       polybenzoxazole-based elec. insulating films in
       semiconductors)
IT
    Polyamides, uses
    RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or
     engineered material use); PREP (Preparation); RACT (Reactant or reagent);
    USES (Uses)
        (reaction products with oligomers; storage-stable varnishes
        for polybenzoxazole-based elec. insulating films in
        semiconductors)
TT
    Dielectric films
     Semiconductor devices
        (storage-stable varnishes for polybenzoxazole-based
        elec. insulating films in semiconductors)
IT
     Polybenzoxazoles
     RL: DEV (Device component use); IMF (Industrial manufacture); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (storage-stable varnishes for polybenzoxazole-based
        elec. insulating films in semiconductors)
TΤ
     Films
        (water-resistant; storage-stable varnishes for polybenzoxazole
        -based elec. insulating films in semiconductors)
     9003-13-8DP, Polypropylene glycol monobutyl ether, aminobenzoate-
IT
     terminated, reaction products with polyamides,
     pyrolyzed 9003-53-6DP, Polystyrene, aminobenzoate-terminated, reaction
     products with polyamides, pyrolyzed 9046-10-0DP,
     Polypropylene glycol bis(2-aminopropyl ether), reaction products
     with polyamides, pyrolyzed 106392-12-5DP, Ethylene
     oxide-propylene oxide block copolymer, reaction products with
     polyamides, pyrolyzed
     RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP
     (Preparation); USES (Uses)
        (oligomeric; storage-stable varnishes for polybenzoxazole
        -based elec. insulating films in semiconductors)
     9011-14-7, Poly(methyl methacrylate) 24980-41-4, Polycaprolactone
IΤ
     25014-31-7, Poly(\alpha-methylstyrene)
                                        25248-42-4, Polycaprolactone,
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (oligomeric; storage-stable varnishes for polybenzoxazole
        -based elec. insulating films in semiconductors)
     545446-42-2DP, 9,9-Bis(3-amino-4-hydroxyphenyl)fluorene-9,9-Bis(4-
IT
     amino-3-hydroxyphenyl)fluorene-4-ethynyl-2,6-naphthalenedicarboxylic
     dichloride copolymer, reaction products with
     aminobenzoate-terminated styrene oligomers, pyrolyzed
                                                             545446-43-3DP.
     3,3'-Diamino-4,4'-dihydroxydiphenyl ether-4,4'-diamino-3,3'-
     dihydroxydiphenyl ether-5-ethynylterephthalic dichloride copolymer,
     reaction products with ethylene oxide-propylene oxide block
     oligomer, pyrolyzed 545446-50-2DP, reaction products
     with ethylene oxide-propylene oxide block oligomer, pyrolyzed
```

545446-51-3DP, reaction products with ethylene
oxide-propylene oxide block oligomer, pyrolyzed 628726-00-1P
628726-56-7P 628727-03-7P 628727-07-1P
628727-40-2P 628727-67-3P 628727-85-5P
RL: DEV (Device component use); IMF (Industrial manufacture);
TEM (Technical or engineered material use); PREP (Preparation);
USES (Uses)
(storage-stable varnishes for polybenzoxazole-based elec. insulating films in semiconductors)

IT 122-04-3DP, 4-Nitrobenzoic acid chloride, reaction products with hydroxy-terminated styrene oligomers, reduced, reaction products with polyamides, pyrolyzed RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP

RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREF (Preparation); USES (Uses)

(storage-stable varnishes for polybenzoxazole-based elec. insulating films in semiconductors)

L30 ANSWER 17 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2003:406535 CAPLUS

DOCUMENT NUMBER:

138:402398

TITLE:

New poly(o-hydroxyamides) for use in the

production of polybenzoxazoles for

use in microelectronics

INVENTOR(S):

Sezi, Recai

PATENT ASSIGNEE(S):

Infineon Technologies AG, Germany

SOURCE:

Ger. Offen., 12 pp. CODEN: GWXXBX

DOCUMENT TYPE:

Patent

LANGUAGE:

German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO. DATE
DE 10145469	Al	20030528	DE 2001-10145469 20010914
US 2003134226	A1	20030717	US 2002-244802 20020916
RITY APPLN. INFO.	:		DE 2001-10145469 A 20010914

PRIORITY APPLN. INFO.:

DE 2001-10145469 A 20010914

AB The title polyamides, with low dielec. consts.

(preferably <3.0) and weak absorption at <248 nm, have at least some of their o-OH groups protected by tert-alkoxycarbonyl groups of specified structure. Adding 40 mmol isophthaloyl chloride in 80 mL butyrolactone dropwise to 50 mmol 4,4'-(hexafluoroisopropylidene)bis(2-aminophenol) bis(tert-Bu carbonate) in 250 mL N-methylpyrrolidone stirred at 10°, stirring for 16 h at room temperature, blocking end-groups by addition of 20 mmol norbornenecarbonyl chloride in 30 mL butyrolactone, stirring for 3 h, adding 120 mmol pyridine in 50 mL butyrolactone dropwise at room temperature, and stirring for 2 h gave a protected poly(o-hydroxyamide)

(I). I was deposited as a 25% cyclopentanone solution on a Si chip, dried for 1 min at 100°, heated at 3°/min under N to 350°, and held for 1 to give a film with dielec. constant 2.6.

IT 531505-39-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses) (poly(o-hydroxyamides) for production of

polybenzoxazoles for use in microelectronics)

531505-39-2 CAPLUS RN

[1,1'-Biphenyl]-4,4'-dicarbonyl dichloride, polymer with 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol], 4,4'-oxybis[2-aminophenol] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[benzoyl chloride] (9CI) (CA INDEX NAME)

1 CM

CN

CRN 20638-07-7 CMF C25 H20 N2 O2

CM

CRN 6423-17-2 CMF C12 H12 N2 O3

CM

CRN 2351-37-3 CMF C14 H8 C12 O2

CRN 1102-92-7 CMF C17 H8 C12 F6 O2

IC ICM C08G073-22

ICS C08G073-10; C09D005-32; C09D005-25; G03F007-38

CC 35-4 (Chemistry of Synthetic High Polymers)

ST polyhydroxyamide intermediate polybenzoxazole;

isophthaloyl chloride polyhydroxyamide; diaminobisphenol BOC

blocked polyhydroxyamide; blocked diaminobisphenol

polyhydroxyamide prepn

IT Polyamides, preparation

RL: IMF (Industrial manufacture); TEM (Technical or engineered material

use); PREP (Preparation); USES (Uses)

(o-hydroxy-, blocked; poly(o-hydroxyamides) for prodn

. of polybenzoxazoles for use in microelectronics)

IT Microelectronics

(poly(o-hydroxyamides) for production of

polybenzoxazoles for use in microelectronics)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material

use); PREP (Preparation); USES (Uses)

(poly(o-hydroxyamides) for production of

polybenzoxazoles for use in microelectronics)

IT 27063-48-5DP, reaction products with polyamide-polyester,

optionally cyclized 112492-59-8DP, reaction products with norbornene carbonylchloride, optionally cyclized 512172-71-3DP, cyclized

512172-71-3P 512172-72-4P 531505-39-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(poly(o-hydroxyamides) for production of

polybenzoxazoles for use in microelectronics)

IT 129708-71-0P

RL: IMF (Industrial manufacture); PREP (Preparation)

(preparation of blocked diaminobisphenols)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 18 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:349523 CAPLUS

DOCUMENT NUMBER: 138:354926

TITLE: Electrically insulating films, materials and

coating varnishes for them, and semiconductor devices

INVENTOR(S): Oki, Hiromi; Nakashima, Michio; Hase, Yoko; Izumi,

Atsush

PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 25 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanes
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

APPLICATION NO. DATE KIND DATE PATENT NO. \_\_\_\_\_ -----JP 2001-331959 20011030 JP 2003128990 A2 20030508 20011030 JP 2001-331959 PRIORITY APPLN. INFO.: Elec. insulating films, useful as interlayer dielec. films for multilayer wiring boards or surface protective layers for semiconductors, have fine pores and comprise resin layers mainly comprising polybenzoxazole structures, prepared by thermal condensation and crosslinking reactions of materials or varnishes containing film-forming polyamide copolymers prepared by reaction of polyamides [NHX(OH)2NHCOYCO]m[NHX(OH)2NHCOZCO]n [R1-R4 = H, monovalent organic group; X = aromatic ring-containing tetravalent group; Y = divalent group; Z = divalent group (structures of X, Y, and Z are given);  $m > 0; n \ge 0; 2 \le m + n \le 1000; 0.05 \le m/(m + n)$ ≤ 1] having branched structures prepared from bisaminophenols and polybasic carboxylic acids, with reactive oligomers having substituents reactive towards carboxyl, amino, or OH groups in the polyamide structures. Thus, 2,2-bis(3-amino-4hydroxyphenyl)hexafluoropropane 35.9, trimesic acid trichloride 0.53, and 4-ethynyl-2,6-naphthalenedicarboxylic acid dichloride 27.7 g were polymerized in N-methyl-2-pyrrolidone (NMP), the reaction mixture was mixed with Et3N, and stirred with a y-butyrolactone solution containing 4-aminobenzoate ester-terminated styrene oligomer (Mn 9600; preparation given) to give a copolymer containing 37% reactive oligomer units, which was dissolved in NMP, applied on an Al-deposited Si wafer, dried at 120° for 240 s, heated at 300° for 60 min under N to form a film of a polybenzoxazole having styrene oligomer units at the terminals, and heated at 400° for 60 min for decomposition of the oligomer units to form a polybenzoxazole film having ≤15-nm pores, dielec. constant (at 1 MHz) 2.1, heat resistance 563°, Tg >450°, and water absorption 0.2%. An electrode

pattern was formed on the polybenzoxazole film by vapor deposition of Al. IT 519142-89-3P RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (thermally decomposed, polybenzoxazole; elec. insulating polybenzoxazole films having fine pores prepared by heating of copolymers from branched polyamides and reactive oligomers for semiconductor devices) 519142-89-3 CAPLUS RN [1,1'-Biphenyl]-3,3',5,5'-tetracarbonyl tetrachloride, polymer with CN  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2ethanediyl)], 2-ethynyl-1,4-benzenedicarbonyl dichloride and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI)

CM 1

CRN 393543-09-4 CMF C10 H4 Cl2 O2

(CA INDEX NAME)

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CRN 113797-72-1 CMF C16 H6 C14 O4

$$\begin{array}{c|c} \circ & \circ & \circ \\ c1-c & & c-c1 \\ \hline & \circ & \circ \\ \end{array}$$

CM 4

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$^{
m NH2}_{
m Me-CH-CH_2-O}$$
  $^{
m NH2}_{
m (C_3H_6)-O-CH_2-CH-Me}$ 

IC ICM C09D177-00 ICS C08G073-22; C08J009-02; C09D005-25; C09D177-06; C09D179-04;

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H01B003-30; H05K003-28; H05K003-46; C08L079-04
     38-3 (Plastics Fabrication and Uses)
CC
     Section cross-reference(s): 25, 35, 37, 42, 76
     elec insulating porous film polybenzoxazole
ST
     semiconductor; reactive oligomer polyamide polybenzoxazole
     porous film; aminobenzoate polystyrene polyamide polybenzoxazole
     porous film; heat water resistance dielec coating
     polybenzoxazole; multilayer wiring board insulator film
     polybenzoxazole
     Electric insulators
IT
        (coatings; elec. insulating polybenzoxazole films
        having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
        devices)
     Semiconductor devices
IT
     Varnishes
        (elec. insulating polybenzoxazole films having fine
        pores prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
TΤ
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (elec. insulating polybenzoxazole films having fine
        pores prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
        (fluorine-containing; elec. insulating polybenzoxazole
        films having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
        devices)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
         (fluorine-containing; elec. insulating polybenzoxazole
        films having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
        devices)
     Dielectric films
IT
         (heat- and water-resistant; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
         oligomers for semiconductor devices)
      Water-resistant materials
 TΤ
         (heat-resistant, dielec. films;
         elec. insulating polybenzoxazole films having fine
         pores prepared by heating of copolymers from branched
         polyamides and reactive oligomers for semiconductor devices)
      Printed circuit boards
 IΤ
         (multilayer; elec. insulating polybenzoxazole films
         having fine pores prepared by heating of copolymers from
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branched polyamides and reactive oligomers for semiconductor
        devices)
     Polybenzoxazoles
TT
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-, fluorine-containing; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyoxyalkylenes, preparation
тт
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-polyamide-, fluorine-containing; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Fluoropolymers, preparation
ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-polyamide-polyoxyalkylene-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyacetylene-polybenzoxazole-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyamides, preparation
ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyacetylene-polyoxyalkylene-, fluorine-containing; elec.
        insulating polybenzoxazole films having fine pores
        prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
     Fluoropolymers, preparation
IT
     Polyoxyalkylenes, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-; elec. insulating polybenzoxazole films
        having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
         devices)
      Polyoxyalkylenes, preparation
 ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-polyether-, cardo; elec. insulating
         polybenzoxazole films having fine pores prepared by
         heating of copolymers from branched polyamides and reactive
         oligomers for semiconductor devices)
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Polyoxyalkylenes, preparation
TT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyether-, fluorine-containing; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyoxyalkylenes, preparation
TТ
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyether-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Cardo polymers
IT
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyether-polyoxyalkylene-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-polyoxyalkylene, fluorine-containing; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-polyoxyalkylene-, cardo; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyacetylenes, preparation
IΤ
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-polyoxyalkylene-, fluorine-containing; elec.
         insulating polybenzoxazole films having fine pores
         prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
      Polyethers, preparation
 IT
      RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-polyoxyalkylene-; elec. insulating
         polybenzoxazole films having fine pores prepared by
         heating of copolymers from branched polyamides and reactive
         oligomers for semiconductor devices)
      Polyethers, uses
 IT
      RL: IMF (Industrial manufacture); TEM (Technical or engineered material
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use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, cardo; elec. insulating
       polybenzoxazole films having fine pores prepared by
       heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyacetylenes, preparation
IΤ
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polybenzoxazole-, fluorine-containing; elec.
        insulating polybenzoxazole films having fine pores
        prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
     Polyethers, uses
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, fluorine-containing; elec.
        insulating polybenzoxazole films having fine pores
        prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
     Fluoropolymers, uses
IΤ
     Polyethers, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Cardo polymers
IT
     Fluoropolymers, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use): PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyether-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polybenzoxazoles
TΤ
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyether-, cardo; elec. insulating polybenzoxazole
        films having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
        devices)
     Polybenzoxazoles
TТ
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyether-, fluorine-containing; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polybenzoxazoles
TΥ
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
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(polyether-; elec. insulating polybenzoxazole films
       having fine pores prepared by heating of copolymers from
       branched polyamides and reactive oligomers for semiconductor
       devices)
ΙT
    Polyamides, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-polyoxyalkylene-, cardo; elec. insulating
       polybenzoxazole films having fine pores prepared by
       heating of copolymers from branched polyamides and reactive
       oligomers for semiconductor devices)
IT
    Polyamides, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-polyoxyalkylene-, fluorine-containing; elec.
        insulating polybenzoxazole films having fine pores
        prepared by heating of copolymers from branched
       polyamides and reactive oligomers for semiconductor devices)
    Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-polyoxyalkylene-; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyoxyalkylene-; elec. insulating polybenzoxazole
        films having fine pores prepared by heating of copolymers from
        branched polyamides and reactive oligomers for semiconductor
        devices)
    Heat-resistant materials
        (water-resistant, dielec. films; elec. insulating
        polybenzoxazole films having fine pores prepared by
        heating of copolymers from branched polyamides and reactive
        oligomers for semiconductor devices)
                                          16819-43-5P, 4,4'-Tolandicarboxylic
     3034-86-4P, Methyl 4-ethynylbenzoate
IT
                          23351-91-9P, 5-Bromoisophthalic acid
                                                                51760-21-5P,
          16882-08-9P
     Dimethyl 5-bromoisophthalate 168619-21-4P 217655-36-2P,
     1-[3,5-Bis(methoxycarbonyl)phenyl]-2-phenylethyne 393543-03-8P,
     4-[3,5-Bis(methoxycarbonyl)phenyl]-2-methyl-3-butyn-1-ol 393543-04-9P,
     5-Ethynylisophthalic acid dipotassium salt
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (elec. insulating polybenzoxazole films having fine
        pores prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
     99-31-0, 5-Aminoisophthalic acid 115-19-5, 3-Methyl-1-butyn-3-ol
     122-04-3, 4-Nitrobenzoic acid chloride 358-23-6,
     Trifluoromethanesulfonic acid anhydride 619-42-1, Methyl 4-bromobenzoate
     13036-02-7, Dimethyl 5-hydroxyisophthalate 62480-31-3
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RL: RCT (Reactant); RACT (Reactant or reagent)
        (elec. insulating polybenzoxazole films having fine
       pores prepared by heating of copolymers from branched
       polyamides and reactive oligomers for semiconductor devices)
    16819-44-6P, 4,4'-Tolandicarboxylic acid dichloride
                                                         393543-05-0P
IT
    393543-14-1P
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (monomer; elec. insulating polybenzoxazole films
       having fine pores prepared by heating of copolymers from
       branched polyamides and reactive oligomers for semiconductor
       devices)
    75-21-8DP, Ethylene oxide, reaction products with styrene
IT
    oligomer, aminobenzoate ester, reaction products with
                150-13-0DP, 4-Aminobenzoic acid, ester with
    hydroxy-terminated styrene oligomer, reaction products with
    polyamides 9003-53-6DP, Polystyrene, aminobenzoate-terminated,
    reaction products with polyamides 519142-88-2DP,
     reaction products with aminobenzoate-terminated styrene oligomer
     519142-89-3P 519142-90-6P 519142-91-7P 519142-93-9P
     519142-94-0P
     RL: IMF (Industrial manufacture); TEM (Technical or engineered
     material use); PREP (Preparation); USES (Uses)
        (thermally decomposed, polybenzoxazole; elec.
        insulating polybenzoxazole films having fine pores
        prepared by heating of copolymers from branched
        polyamides and reactive oligomers for semiconductor devices)
L30 ANSWER 19 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                        2003:298646 CAPLUS
ACCESSION NUMBER:
                        138:328986
DOCUMENT NUMBER:
                        High-temperature-resistant deep-UV-sensitive
TITLE:
                        photoresist composition for forming dielectric
                        or buffer layer in microelectronics
                       Recai, Sezi
INVENTOR(S):
PATENT ASSIGNEE(S): Infineon Technologies AG, Germany
                        Ger. Offen., 16 pp.
SOURCE:
                        CODEN: GWXXBX
                        Patent
DOCUMENT TYPE:
                        German
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                        APPLICATION NO. DATE
     PATENT NO. KIND DATE
     PATENT NO. KIND DATE
                                         ______
     DE 10145472 A1 20030417 DE 2001-10145472 20010914 US 2003087190 A1 20030508 US 2002-244280 20020916
                                      DE 2001-10145472 A 20010914
PRIORITY APPLN. INFO.:
AB The title photoresist composition comprises a poly-o-hydroxyamide
     with tert-butoxycarbonyl groups -COOCR3R4R5 (R3-5 = -H, -F, -(CH2)nCH3,
     -(CF2)nCF3; n = 0-10) as protective groups, a photoacid, and mixed
     solvents. The photoresist composition shows high photosensitivity to 248 nm
```

IT

CN

light exposure compared to a conventional photoresist composition without the above protective groups. After the cyclization conversion of polyohydroxyamide into polybenzoxazole, the new photoresist composition shows surprisingly a smaller dielec. constant than the conventional photoresist composition without the protective groups. 512172-70-2P

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(in high-temperature-resistant photoresist composition for forming dielec or buffer layer in microelectronics)

RN 512172-70-2 CAPLUS

Carbonic acid, 9H-fluoren-9-ylidenebis(2-amino-4,1-phenylene)
bis(1,1-dimethylethyl) ester, polymer with [1,1'-biphenyl]-4,4'-dicarbonyl
dichloride, oxybis(2-amino-4,1-phenylene) bis[(1,1-dimethylethyl)
carbonate] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[ben
zoyl chloride] (9CI) (CA INDEX NAME)

CM 1

CRN 512172-69-9 CMF C35 H36 N2 O6

CM 2

CRN 512172-68-8 CMF C22 H28 N2 O7

CRN 2351-37-3 CMF C14 H8 Cl2 O2

CM 4

CRN 1102-92-7 CMF C17 H8 C12 F6 O2

IC ICM G03F007-038

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 38, 76

ST photoresist compn poly ortho hydroxyamide deep UV microelectronic polybenzoxazole

IT Photoresists

(UV; high-temperature-resistant photoresist composition for forming dielec . or buffer layer in microelectronics)

IT Polybenzoxazoles

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(acrylic; in high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

IT Polybenzoxazoles

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(cardo, fluorine-containing; polybenzoxazole in high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

IT Electric insulators

IΤ

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Heat-resistant materials
    Microelectronic devices
        (high-temperature-resistant photoresist composition for forming dielec.
       or buffer layer in microelectronics)
    Polvesters, processes
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); TEM (Technical or engineered material
    use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-, fluorine-containing; poly-o-hydroxyamide in
       high-temperature-resistant photoresist composition for forming dielec.
       or buffer layer in microelectronics)
    Fluoropolymers, processes
IT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-polyester-; poly-o-hydroxyamide in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
IT
     Polyethers, processes
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-, cardo; polybenzoxazole in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
IT
     Polyethers, processes
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-, fluorine-containing; polybenzoxazole
        in high-temperature-resistant photoresist composition for forming dielec
        . or buffer layer in microelectronics)
     Cardo polymers
ΙT
     Fluoropolymers, processes
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-polyether-; polybenzoxazole in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
     Cardo polymers
TΤ
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
         (polybenzoxazoles, fluorine-containing; polybenzoxazole
        in high-temperature-resistant photoresist composition for forming dielec
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. or buffer layer in microelectronics) Polyamides, processes IT RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses) (polyester-, fluorine-containing; poly-o-hydroxyamide in

```
high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
    Polybenzoxazoles
ΙT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); TEM (Technical or engineered material
    use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyether-, cardo; polybenzoxazole in high-temperature-resistant
       photoresist composition for forming dielec. or buffer layer in
        microelectronics)
    Polybenzoxazoles
ΙT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyether-, fluorine-containing; polybenzoxazole in
       high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
     108-31-6DP, Maleic acid anhydride, reaction products with
IT
     fluorine-containing polybenzoxazole-polyethers 72123-18-3P
     512172-70-2P 512172-71-3DP, reaction products with
     maleic acid anhydride 512172-72-4P
                                          512172-73-5P
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
     (Physical, engineering or chemical process); TEM (Technical or engineered
     material use); PREP (Preparation); PROC (Process); USES (Uses)
        (in high-temperature-resistant photoresist composition for forming dielec
        . or buffer layer in microelectronics)
                                          57840-38-7, Triphenylsulfonium
     1886-74-4 4450-68-4 41580-58-9
IT
     hexafluoroantimonate 84563-54-2
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); TEM (Technical or engineered material use); PROC (Process); USES
     (Uses)
        (photoacid in high-temperature-resistant photoresist composition for forming
        dielec. or buffer layer in microelectronics)
     920-46-7DP, Methacrylic acid chloride, reaction products acrylic
TT
     polybenzoxazoles 27063-48-5DP, reaction products with
     fluorine-containing polyester-polyamides 512172-64-4DP,
     norbornenecarboxylic acid terminated 512172-65-5P
                                                         512172-67-7DP,
     methacrylic acid terminated
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (poly-o-hydroxyamide in high-temperature-resistant photoresist
        composition for forming dielec. or buffer layer in
        microelectronics)
L30 ANSWER 20 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                         2003:298645 CAPLUS
ACCESSION NUMBER:
                         138:328985
DOCUMENT NUMBER:
                         High-temperature-resistant photoresist composition for
TITLE:
                          forming dielectric or buffer layer in
                          microelectronics
                         Sezi, Recai
INVENTOR (S):
PATENT ASSIGNEE(S): Infineon Technologies AG, Germany
```

SOURCE:

Ger. Offen., 18 pp.

CODEN: GWXXBX

DOCUMENT TYPE:

Patent

LANGUAGE:

German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

APPLICATION NO. DATE KIND DATE PATENT NO. \_\_\_\_\_ \_\_\_\_\_ A1 20030417 DE 2001-10145471 20010914 A1 20030529 US 2002-244257 20020916 \_\_\_\_45471 US 2003099904 DE 10145471 DE 2001-10145471 A 20010914 PRIORITY APPLN. INFO.:

The title photoresist composition comprises a poly-o-hydroxyamide with free hydroxy groups, a dissoln. inhibitor, a photoacid, and a polar solvent. The photoresist composition shows high photosensitivity compared to a conventional quinone azide based photoresist composition After the cyclization conversion of poly-o-hydroxyamide into polybenzoxazole

, the new photoresist composition shows surprisingly a smaller dielec . constant than the conventional quinone azide based photoresist composition

512173-67-0P 512173-69-2DP, benzoic chloride terminated

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polybenzoxazole in high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

512173-67-0 CAPLUS RN

[1,1'-Biphenyl]-4,4'-dicarbonyl dichloride, polymer with 1,3-benzenedicarbonyl dichloride, 4,6-diamino-1,3-benzenediol and 4,4'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 512173-66-9 CMF C37 H28 N2 O4

CRN 15791-87-4 CMF C6 H8 N2 O2

CM 3

CRN 2351-37-3 CMF C14 H8 C12 O2

CM 4

CRN 99-63-8 CMF C8 H4 Cl2 O2

RN 512173-69-2 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, polymer with 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[benzoyl chloride] (9CI) (CA INDEX NAME)

CM :

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 2

CRN 1102-92-7 CMF C17 H8 C12 F6 O2

$$\begin{array}{c|c} & & & \\ & & & \\ \text{C1-c} & & & \\ & & & \\ \text{CF}_3 & & \\ & & & \\ \text{CF}_3 & & \\ & & & \\ \text{C-c1} & & \\ & & & \\ \end{array}$$

CM 3

CRN 99-63-8 CMF C8 H4 Cl2 O2

IC ICM G03F007-038

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 38, 76

ST photoresist compn poly ortho hydroxyamide dielec buffer microelectronic polybenzoxazole

IT Polybenzoxazoles

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(acrylic; in high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

IT Polybenzoxazoles

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(cardo, fluorine-containing; polybenzoxazole in

high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

TT Electric insulators

Heat-resistant materials

Microelectronic devices

Photoresists

(high-temperature-resistant photoresist composition for forming  $\tt dielec.$  or buffer layer in microelectronics)

IT Polyvinyl butyrals

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(in high-temperature-resistant photoresist composition for forming  $\tt dielec$  . or buffer layer in microelectronics)

IT Polyesters, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyamide-, fluorine-containing; poly-o-hydroxyamide in

high-temperature-resistant photoresist composition for forming dielec.

or buffer layer in microelectronics)

IT Fluoropolymers, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(polyamide-polyester-; poly-o-hydroxyamide in

high-temperature-resistant photoresist composition for forming dielec. or buffer layer in microelectronics)

```
Polyethers, processes
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-, cardo; polybenzoxazole in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
     Polyethers, processes
TТ
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-, fluorine-containing; polybenzoxazole
        in high-temperature-resistant photoresist composition for forming dielec
        . or buffer layer in microelectronics)
     Cardo polymers
TT
     Fluoropolymers, processes
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole-polyether-; polybenzoxazole in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
     Cardo polymers
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazoles, fluorine-containing; polybenzoxazole
        in high-temperature-resistant photoresist composition for forming dielec
        . or buffer layer in microelectronics)
     Polyamides, processes
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyester-, fluorine-containing; poly-o-hydroxyamide in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
     Polybenzoxazoles
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
         (polyether-, cardo; polybenzoxazole in high-temperature-resistant
        photoresist composition for forming dielec. or buffer layer in
        microelectronics)
     Polybenzoxazoles
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
         (polyether-, fluorine-containing; polybenzoxazole in
        high-temperature-resistant photoresist composition for forming dielec.
        or buffer layer in microelectronics)
                                        5551-72-4 35343-63-6, tert-Butyl
                            4450-68-4
                1886-74-4
IT
```

methacrylate-methacrylic acid copolymer 41580-58-9 57840-38-7,

```
Triphenylsulfonium hexafluoroantimonate
                                              84563-54-2
                                                            87188-51-0,
     p-tert-Butoxycarbonyloxystyrene 145531-11-9 380848-50-0 512173-70-5
    RL: CPS (Chemical process); PEP (Physical, engineering or chemical
    process); TEM (Technical or engineered material use); PROC (Process); USES
     (Uses)
        (in high-temperature-resistant photoresist composition for forming dielec
        . or buffer layer in microelectronics)
     27063-48-5DP, reaction products with fluorine-containing polyester-
IT
                 112492-59-8DP, norbornenecarboxylic acid terminated
     polyamides
     512173-65-8P
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); TEM (Technical or engineered material
     use); PREP (Preparation); PROC (Process); USES (Uses)
        (poly-o-hydroxyamide in high-temperature-resistant photoresist
        composition for forming dielec. or buffer layer in
        microelectronics)
     98-88-4DP, Benzoic acid chloride, reaction products with
IT
     fluorine-containing cardo polybenzoxazoles 108-31-6DP, Maleic acid
     anhydride, reaction products with fluorine-containing
     polybenzoxazole-polyethers 920-46-7DP, Methacrylic acid
     chloride, reaction products with acrylic polybenzoxazole
     512172-72-4DP, methacrylic acid terminated 512173-67-0P
     512173-68-1DP, reaction products with maleic anhydride
     512173-69-2DP, benzoic chloride terminated
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
     (Physical, engineering or chemical process); TEM (Technical or engineered
     material use); PREP (Preparation); PROC (Process); USES (Uses)
        (polybenzoxazole in high-temperature-resistant photoresist composition
        for forming dielec. or buffer layer in microelectronics)
     56-55-3, 1,2-Benzanthracene 120-12-7, Anthracene, processes
                                                                     198-55-0,
IT
     Pervlene
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); TEM (Technical or engineered material use); PROC (Process); USES
     (Uses)
        (sensitizer in high-temperature-resistant photoresist composition for
forming
        dielec. or buffer layer in microelectronics)
L30 ANSWER 21 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                         2003:274807 CAPLUS
ACCESSION NUMBER:
                         138:288731
DOCUMENT NUMBER:
                         Polybenzoxazole precursors, their condensed
TITLE:
                         crosslinked polybenzoxazoles, insulating
                         films, and semiconductor devices
                         Ishida, Yuichi; Enoki, Naoshi
INVENTOR(S):
                         Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
```

Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

Patent Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

SOURCE:

LANGUAGE:

DOCUMENT TYPE:

APPLICATION NO. DATE KIND DATE PATENT NO. ----\_\_\_\_\_ 20010928 A2 20030409 JP 2003105086 JP 2001-302665 JP 2001-302665 20010928 PRIORITY APPLN. INFO.: The polybenzoxazole precursors comprise AB [HNX (OH) 2NHCOYCO] m [HNX (OH) 2NHCOZCO] n [X = (substituted) tetravalent benzene derivative group; Y = (substituted) naphthylethynyl-containing divalent benzene derivative; Z = (substituted) benzene derivative or cyclohexane derivative; m >0;  $n \ge 0$ ; (m + n) = 2-1000; m/(m + n) = 0.05-1]. Thus, polymerization of 3,3'-diamino-4,4'-dihydroxybiphenyl and 5-(1-naphthylethynyl)isophthalic acid dichloride gave a copolymer with Mn 7000, which was dissolved in N-methyl-2-pyrrolidone, applied on a glass plate, and baked to give a crosslinked polybenzoxazole film with dielec. constant 3.15, Tg >450°, and 5% weight loss temperature 524°. 505059-41-6P 505059-50-7P IT RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (polybenzoxazole precursors and their condensed crosslinked polybenzoxazoles for insulating films with good heat resistance) 505059-41-6 CAPLUS RN Poly[iminocarbonyl[5-(1-naphthalenylethynyl)-1,3-CN phenylene]carbonylimino(4,4'-dihydroxy[1,1'-biphenyl]-3,3'-diyl)] (9CI) (CA INDEX NAME)

RN 505059-50-7 CAPLUS
CN Poly[iminocarbonyl[5-(1-naphthalenylethynyl)-1,3-phenylene]carbonylimino(6-hydroxy-1,3-phenylene)-9H-fluoren-9-ylidene(4-hydroxy-1,3-phenylene)]

(9CI) (CA INDEX NAME)

IT 505059-40-5P 505059-49-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(polybenzoxazole precursors and their condensed crosslinked polybenzoxazoles for insulating films with good heat

resistance)

RN 505059-40-5 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-(1-naphthalenylethynyl)-, polymer with 3,3'-diamino[1,1'-biphenyl]-4,4'-diol (9CI) (CA INDEX NAME)

CM 1

CN

CRN 505059-39-2

CMF C20 H10 C12 O2

CM 2

CRN 4194-40-5 CMF C12 H12 N2 O2

RN 505059-49-4 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-(1-naphthalenylethynyl)-, polymer with 4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM :

CRN 505059-39-2 CMF C20 H10 Cl2 O2

CM 2

CRN 20638-07-7 CMF C25 H20 N2 O2

IC ICM C08G073-22

ICS C08J005-18; H01L021-312; C08L079-04

CC 38-3 (Plastics Fabrication and Uses)

```
Section cross-reference(s): 76
     polybenzoxazole precursor polyamide insulating film
ST
     semiconductor crosslinking; aminohydroxybiphenyl naphthylethynyl
     isophthaloyl chloride polybenzoxazole heat
     resistance
     Polybenzoxazoles
ТΤ
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (cardo, crosslinked; polybenzoxazole precursors and their
        condensed crosslinked polybenzoxazoles for insulating films
        with good heat resistance)
IT
     Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (cardo; polybenzoxazole precursors and their condensed
        crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (crosslinked; polybenzoxazole precursors and their condensed
        crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
     Heat-resistant materials
IT
        (films; polybenzoxazole precursors and their condensed
        crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
     Polybenzoxazoles
TΤ
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
         (fluorine-containing, crosslinked; polybenzoxazole precursors and
        their condensed crosslinked polybenzoxazoles for insulating
        films with good heat resistance)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (fluorine-containing; polybenzoxazole precursors and their
        condensed crosslinked polybenzoxazoles for insulating films
        with good heat resistance)
ΙT
     Films
         (heat-resistant; polybenzoxazole
        precursors and their condensed crosslinked polybenzoxazoles
         for insulating films with good heat resistance)
     Fluoropolymers, preparation
IT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
      (Reactant or reagent)
         (polyamide-; polybenzoxazole precursors and their condensed
         crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
      Cardo polymers
 IT
      RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
```

(Reactant or reagent)

```
(polyamides; polybenzoxazole precursors and their
        condensed crosslinked polybenzoxazoles for insulating films
       with good heat resistance)
    Dielectric films
IT
    Semiconductor devices
        (polybenzoxazole precursors and their condensed crosslinked
        polybenzoxazoles for insulating films with good heat
    Polyamides, preparation
ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polybenzoxazole precursors and their condensed crosslinked
        polybenzoxazoles for insulating films with good heat
        resistance)
     Fluoropolymers, uses
IT
     Polyethers, uses
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, crosslinked; polybenzoxazole
        precursors and their condensed crosslinked polybenzoxazoles
        for insulating films with good heat resistance)
IT
     Cardo polymers
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazoles, crosslinked; polybenzoxazole
        precursors and their condensed crosslinked polybenzoxazoles
        for insulating films with good heat resistance)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polyether-, crosslinked; polybenzoxazole precursors and
        their condensed crosslinked polybenzoxazoles for insulating
        films with good heat resistance)
     Polyamides, preparation
IΤ
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-; polybenzoxazole precursors and their condensed
        crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
     505059-42-7P 505059-45-0P 505059-48-3P
                                                  505059-51-8P
                                                                  505059-52-9P
TT
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
         (crosslinked; polybenzoxazole precursors and their condensed
        crosslinked polybenzoxazoles for insulating films with good
        heat resistance)
                                  505059-47-2P 505059-50-7P
                    505059-44-9P
IT
     505059-41-6P
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP
      (Preparation); RACT (Reactant or reagent)
         (polybenzoxazole precursors and their condensed crosslinked
        polybenzoxazoles for insulating films with good heat
        resistance)
```

L30 ANSWER 22 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2003:271760 CAPLUS

DOCUMENT NUMBER:

138:288676

TITLE:

Polybenzoxazole precursors and their

condensate organic insulating films with good

heat resistance Hase, Yoko

INVENTOR(S):

PATENT ASSIGNEE(S):

Sumitomo Bakelite Co., Ltd., Japan

Jpn. Kokai Tokkyo Koho, 9 pp. CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

SOURCE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

KIND DATE APPLICATION NO. DATE PATENT NO. -----\_\_\_\_\_\_ JP 2001-298562 20010927 JP 2003105085 A2 20030409 JP 2001-298562 20010927 PRIORITY APPLN. INFO.: The films, useful for semiconductor devices, etc., are manufactured by condensation of polybenzoxazole precursors (CONHX (OH) 2NHCOY) n [X = substituted tetravalent benzene derivative group; Y = (substituted) divalent benzene derivative; n = 2-1000] prepared from bulky diaminophenols X(NH)2(OH)2 and bulky dicarboxylic acids Y(CO2H)2 (X, Y = same as the above). Thus, polymerization of

9,9-bis-[2-methyl-5-cyclohexyl-4-[(4-

amino-3-hydroxy)phenoxy]phenyl]fluorene and 5-tert-butylisophthalic acid dichloride gave a copolymer with Mn 7.0 + 103 and Mw 1.36 + 104, which was dissolved in N-methyl-2-pyrrolidone, applied on a silicon wafer, dried, and baked to give a polybenzoxazole film with d. 1.17 g/cm3, dielec. constant 2.64, and 5% weight loss temperature 469°.

TT 505072-96-8P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

RN 505072-96-8 CAPLUS

CN Poly[oxy(2-cyclohexy1-5-methy1-1,4-phenylene)-9H-fluoren-9-ylidene(5-cyclohexy1-2-methyl-1,4-phenylene) oxy(3-hydroxy-1,4-

phenylene) iminocarbonyl [5-(1,1-dimethylethyl)-1,3-

phenylene]carbonylimino(2-hydroxy-1,4-phenylene)] (9CI) (CA INDEX NAME)

- \* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY AVAILABLE VIA OFFLINE PRINT \*
- \* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY AVAILABLE VIA OFFLINE PRINT \* IT 505072-95-7P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

RN 505072-95-7 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-(1,1-dimethylethyl)-, polymer with 3,3'-[9H-fluoren-9-ylidenebis[(2-cyclohexyl-5-methyl-4,1-phenylene)oxy]]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 505072-94-6 CMF C51 H52 N2 O4

PAGE 1-A

CRN 13239-25-3 CMF C12 H12 C12 O2

IC ICM C08G073-22

ICS H01L021-312

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST polybenzoxazole precursor polyamide insulating film bulky;
heat resistance film polybenzoxazole polyether
cardo semiconductor; methylcyclohexyl aminohydroxyphenoxyphenyl fluorene
butylisophthaloyl chloride polybenzoxazole

IT Heat-resistant materials

(films; polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

IT Films

(heat-resistant; polybenzoxazole

precursors and their condensate organic insulating films with good heat resistance)

IT Polyethers, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polyamide-, cardo; polybenzoxazole precursors and their

TΤ

1T

IT

IT

IT

IT

```
condensate organic insulating films with good heat
       resistance)
    Polyethers, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-, fluorene group-containing, cardo; polybenzoxazole
       precursors and their condensate organic insulating films with good
       heat resistance)
    Polyethers, preparation
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-; polybenzoxazole precursors and their condensate
        organic insulating films with good heat resistance)
    Cardo polymers
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyethers, fluorene group-containing; polybenzoxazole
       precursors and their condensate organic insulating films with good
       heat resistance)
    Cardo polymers
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-polyethers; polybenzoxazole precursors and their
        condensate organic insulating films with good heat
       resistance)
    Dielectric films
    Semiconductor devices
        (polybenzoxazole precursors and their condensate organic
        insulating films with good heat resistance)
    Polvethers, uses
IT
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, cardo; polybenzoxazole
        precursors and their condensate organic insulating films with good
       heat resistance)
IT
    Polyethers, uses
    RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; polybenzoxazole precursors and
        their condensate organic insulating films with good heat
        resistance)
    Cardo polymers
     RL: IMF (Industrial manufacture); TEM (Technical or engineered material
     use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyether-; polybenzoxazole
        precursors and their condensate organic insulating films with good
        heat resistance)
IT
     Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-, cardo; polybenzoxazole precursors and their
        condensate organic insulating films with good heat
```

resistance)

## IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, cardo; polybenzoxazole precursors and their condensate organic insulating films with good heat

## resistance) IT Polyamides, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polyether-, fluorene group-containing, cardo; polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

## IT Polyamides, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polyether-; polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

## IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-; polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

IT 505072-96-8P 505073-00-7P 505073-04-1P 505073-11-0P RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

IT 505072-95-7P 505072-97-9P 505072-99-1P 505073-01-8P 505073-03-0P 505073-06-3P 505073-09-6P 505073-13-2P RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(polybenzoxazole precursors and their condensate organic insulating films with good heat resistance)

L30 ANSWER 23 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:978475 CAPLUS

DOCUMENT NUMBER: 138:57579

TITLE: Composition and process for the production

of a porous layer on substrates using the composition

INVENTOR(S): Sezi, Recai

PATENT ASSIGNEE(S): Germany

SOURCE: U.S. Pat. Appl. Publ., 8 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE
US 2002198277 A1 20021226 US 2002-180438 20020626

DE 10130601 A1 20030109 DE 2001-10130601 20010626 PRIORITY APPLN. INFO.: DE 2001-10130601 A 20010626

AB Production of a porous layer on a substrate includes using a composition which includes a first polymer component and a second polymer component (such as polycarbonates, polyacetals, aliphatic polyethers, and polyesters), the first polymer component being polyhydroxyamide and/or polybenzoxazole and stable at a temperature at which the second polymer component decomps. and volatilizes. When the composition is heated to the decomposition temperature of the second polymer component, the second component volatilizes and a porous layer that contains the first component remains.

IT 479070-81-0DP, carboxy-terminated 479070-82-IP
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); POF (Polymer in formulation);
 TEM (Technical or engineered material use); PREP (Preparation);

PROC (Process); USES (Uses)
(component with higher thermal stability; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

RN 479070-81-0 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 2

CRN 99-63-8 CMF C8 H4 Cl2 O2

RN 479070-82-1 CAPLUS

CN Poly[oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenyleneoxy(3-hydroxy-1,4-phenylene) iminocarbonyl-1,3-phenylenecarbonylimino(2-hydroxy-1,4-phenylene)] (9CI) (CA INDEX NAME)

IC ICM C08J009-00

NCL 521134000

CC 42-10 (Coatings, Inks, and Related Products)
Section cross-reference(s): 76

ST porous polyhydroxyamide elec insulating coating;
polybenzoxazole porous elec insulating coating;
polycarbonate volatilizable component porous coating manuf;
polyester volatilizable component porous coating manuf; aliph
polyether volatilizable component porous coating manuf;
polyacetal volatilizable component porous coating manuf;

dielec porous film polybenzoxazole

IT Polyethers, uses

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PROC (Process); USES (Uses) (aliphatic, component with lower thermal stability; production of porous elec. insulating coatings by heating blends containing

polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Electric insulators

Porous materials

(coatings; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Polybenzoxazoles

RL: TEM (Technical or engineered material use); USES (Uses)
(component with higher thermal stability; production of porous
elec. insulating coatings by heating blends containing polymers
that volatilize at lower temps. than other polymers in blends on
substrates)

IT Polyesters, uses

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PROC (Process); USES (Uses) (component with lower thermal stability; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Polycarbonates, uses

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(component with lower thermal stability; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Polyamides, uses

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(hydroxy-containing, component with higher thermal stability; prodn . of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Dielectric films

(porous; production of porous dielec. films by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Coating materials

(porous; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT Polyoxymethylenes, uses

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PROC (Process); USES (Uses)

(production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT 479070-81-0DP, carboxy-terminated 479070-82-1P

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP

```
(Physical, engineering or chemical process); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
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(component with higher thermal stability; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT 9046-10-0, Polypropylene glycol bis(2-aminopropyl ether)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PROC (Process); USES (Uses) (component with lower thermal stability; production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

IT 479070-83-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(production of porous elec. insulating coatings by heating blends containing polymers that volatilize at lower temps. than other polymers in blends on substrates)

L30 ANSWER 24 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2002:778021 CAPLUS

DOCUMENT NUMBER:

137:295383

TITLE:

Polyhydroxyamides for polyoxazole coating

materials for electronic components

INVENTOR (S):

Halik, Marcus; Lowack, Klaus; Sezi, Recai; Walter,

APPLICATION NO. DATE

Andreas

PATENT ASSIGNEE(S):

Infineon Technologies AG, Germany

SOURCE:

PCT Int. Appl., 73 pp.

CODEN: PIXXD2

Patent

DOCUMENT TYPE: LANGUAGE:

German

FAMILY ACC. NUM. COUNT: 1

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PATENT NO. KIND DATE

PATENT INFORMATION:

FAILUI IIV.				
WO 2002079297	A2 20	0021010	WO 2002-EP3577	20020328
WO 2002079297	A3 20	0030130		
W: CN, JP,	KR, US			
DE 10115882	A1 20	0021205	DE 2001-10115882	20010330
PRIORITY APPLN. INFO	.:	DE	2001-10115882 A	20010330
AB The invention relates to soluble polyhydroxyamide compds. that, in				
the thermally cured form of their oxazoles, are suited as a elec				
. insulating, heat-resistant coating material,				
particularly for metallic and nonmetallic electronic components. A				
typical polyhydroxyamide was manufactured by stirring NMP				
containing 10 g 9,9'-bis[4-[(4-amino-3-hydroxy)phenoxy]phenyl]fluorene 1 h				
with $\gamma$ -butyrolactone containing 4.83 g 5-ethynylisophthaloyl chloride at				
10°, adding NMP containing 7.08 g UC Carb 100 [1,4-				
cyclohexanedimethanol polycarbonate bis(6-hydroxyhexyl ester)] dropwise,				
	WO 2002079297 WO 2002079297 W: CN, JP, DE 10115882 PRIORITY APPLN. INFO AB The invention r the thermally c . insulating, h particularly fo typical polyhyd containing 10 g with γ-butyrola 10°, adding MMP	WO 2002079297 A2 2 WO 2002079297 A3 2 W: CN, JP, KR, US DE 10115882 A1 2 PRIORITY APPLN. INFO:: AB The invention relates to the thermally cured form insulating, heat-resis particularly for metalli typical polyhydroxyamide containing 10 g 9,9'-bis with y-butyrolactone con 10°, adding NMP containi	WO 2002079297 A2 20021010 WO 2002079297 A3 20030130  W: CN, JP, KR, US  DE 10115882 A1 20021205  PRIORITY APPLN. INFO.: DE  The invention relates to soluble polyh the thermally cured form of their oxaz . insulating, heat-resistant coating m particularly for metallic and nonmetal typical polyhydroxyamide was manufactu containing 10 g 9,9'-bis[4-[(4-amino-3 with γ-butyrolactone containing 4.83 g 10°, adding NMP containing 7.08 g UC C	WO 2002079297 A2 20021010 WO 2002-EP3577 WO 2002079297 A3 20030130 W: CN, JP, KR, US DE 10115882 A1 20021205 DE 2001-10115882 PRIORITY APPLN. INFO: DE 2001-10115882 A  The invention relates to soluble polyhydroxyamide composite the thermally cured form of their oxazoles, are suited insulating, heat-resistant coating material, particularly for metallic and nonmetallic electronic of typical polyhydroxyamide was manufactured by stirring secontaining 10 g 9,9'-bis[4-[(4-amino-3-hydroxy)phenoxy) with y-butyrolactone containing 4.83 g 5-ethynylisophilo°, adding NMP containing 7.08 g UC Carb 100 [1,4-

stirring an addnl. 1.5 h at 10°, stirring 12 h at 20°, cooling to 10°, adding NMP containing 5.4 g Et3N, warming to room temperature, and stirring 2 h.

IT 470465-04-4P 470465-07-7P 470465-09-9P 470465-10-2P 470465-11-3P 470478-06-9P

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); PREP (Preparation); PROC (Process)

(soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components)

RN 470465-04-4 CAPLUS

1,2-Benzenedicarboxylic acid, polymer with 1,4-benzenedicarbonyl dichloride, 1,2-ethanediol, 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and  $_{\alpha}$ -(6-hydroxyhexyl)- $_{\omega}$ -[[[(6-hydroxyhexyl)oxy]carbonyl)oxy]poly(oxycarbonyloxymethylene-1,4-cyclohexanediylmethylene), block (9CI) (CA INDEX NAME)

CM :

CN

CRN 470465-03-3 CMF (C9 H14 O3)n C13 H26 O5 CCI PMS

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CRN 107-21-1

CMF C2 H6 O2

$$_{\text{HO}^-\text{ CH}_2^-\text{ CH}_2^-\text{ OH}}$$

CM 4

CRN 100-20-9

CMF C8 H4 Cl2 O2

CM 5

CRN 88-99-3 CMF C8 H6 O4

RN 470465-07-7 CAPLUS

CN 1,2-Benzenedicarboxylic acid, polymer with 1,3-benzenedicarbonyl dichloride, 1,2-ethanediol and 4,4'-(9H-fluoren-9-ylidene)bis[2aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 2

CRN 107-21-1 CMF C2 H6 O2

$$_{\rm HO^-\,CH_2^-\,CH_2^-\,OH}$$

CM 3

CRN 99-63-8 CMF C8 H4 Cl2 O2

CRN 88-99-3 CMF C8 H6 O4

RN 470465-09-9 CAPLUS

CN Carbonic acid, polymer with 1,4-cyclohexanedimethanol, 5-ethynyl-1,3-benzenedicarbonyl dichloride and 4,4'-(9H-fluoren-9ylidene)bis[2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 2

CRN 20638-07-7 CMF C25 H20 N2 O2

CM 3

CRN 463-79-6 CMF C H2 O3

CM 4

CRN 105-08-8 CMF C8 H16 O2

RN 470465-10-2 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with

4,4'-(9H-fluoren-9-ylidene)bis[2-aminophenol] and  $\alpha$ -(6-hydroxyhexyl)- $\omega$ -[[(6-hydroxyhexyl)oxy]carbonyl]oxy]poly(oxycarbonyloxymethylene-

1,4-cyclohexanediylmethylene), block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 470465-03-3

CMF (C9 H14 O3)n C13 H26 O5

CCI PMS

$$\begin{array}{c|c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ &$$

CM 2

CRN 393543-05-0

CMF C10 H4 C12 O2

CM 3

CRN 20638-07-7 CMF C25 H20 N2 O2

RN 470465-11-3 CAPLUS

CN Carbonic acid, polymer with 5-ethynyl-1,3-benzenedicarbonyl dichloride, 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and 1,6-hexanediol, block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 3

CRN 629-11-8 CMF C6 H14 O2

 $_{\rm HO^-}$  (CH<sub>2</sub>)  $_{\rm 6}^-$  OH

CM 4

CRN 463-79-6 CMF C H2 O3

RN 470478-06-9 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and  $\alpha$ -(6-hydroxyhexyl)- $\omega$ -[[[(6-hydroxyhexyl)oxy]carbonyl]oxy]poly( oxycarbonyloxymethylene-1,4-cyclohexanediylmethylene), block (9CI) (CA

INDEX NAME)

CM 1

CRN 470465-03-3

CMF (C9 H14 O3)n C13 H26 O5

CCI PMS

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 3

CRN 359642-31-2 CMF C37 H28 N2 O4

IT 470465-13-5P 470465-15-7P

RL: IMF (Industrial manufacture); PREF (Preparation)
(soluble polyhydroxyamides for heat-resistant
polyoxazole coating materials for electronic components)

RN 470465-13-5 CAPLUS

Carbonic acid, polymer with 5-ethynyl-1,3-benzenedicarbonyl dichloride, 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol], 1,6-hexanediol and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis [2-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CN

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 3

CRN 83558-87-6 CMF C15 H12 F6 N2 O2

$$\begin{array}{c|c} & CF_3 \\ \hline \\ CF_3 \\ \hline \\ CF_3 \\ \hline \\ OH \\ \end{array}$$

CM 4

CRN 629-11-8 CMF C6 H14 O2

 $_{\rm HO^-}$  (CH<sub>2</sub>)<sub>6</sub>-OH

CM 5

CRN 463-79-6 CMF C H2 O3

CN

RN 470465-15-7 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with 1,4-benzenedicarbonyl dichloride, 3,3'-diamino[1,1'-biphenyl]-4,4'-diol, 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and  $\alpha$ -(6-hydroxyhexyl)- $\omega$ -[[[(6-hydroxyhexyl)oxy]carbonyl]oxy]poly(oxycarbonyloxymethylene-1,4-cyclohexanediylmethylene), block (9CI) (CA INDEX NAME)

CM 1

CRN 470465-03-3 CMF (C9 H14 O3)n C13 H26 O5 CCI PMS

$$\begin{array}{c} & & & \\ & &$$

CM 2

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 3

CRN 359642-31-2

Page 188 Duc10609460

CMF C37 H28 N2 O4

CM 4

CRN 4194-40-5 CMF C12 H12 N2 O2

$$\begin{array}{c|c} & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

°м =

CRN 100-20-9 CMF C8 H4 C12 O2

IC ICM C08G069-26

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ICS C08G069-32; C08G073-22; H01B003-30
     35-5 (Chemistry of Synthetic High Polymers)
CC
     Section cross-reference(s): 76
     polyoxazole thermosetting elec insulating heat
ST
     resistant coating electronic component; cyclohexanedimethanol
     polycarbonate bishydroxyhexyl ester polyhydroxyamide
     manuf polyoxazole precursor; bisaminohydroxyphenoxyphenylfluorene
     ethynylisophthaloyl chloride copolymer manuf polyoxazole
     precursor; soluble polyhydroxyamide precursor thermosetting
     coating electronic component
IT
     Polycarbonates, preparation
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
        (polyamide-, block, cardo; soluble polyhydroxyamides for
        heat-resistant polyoxazole coating materials for
        electronic components)
IT
     Polycarbonates, preparation
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-, block; soluble polyhydroxyamides for heat
        -resistant polyoxazole coating materials for electronic
        components)
IT
     Polyesters, preparation
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
        (polyamide-, fluorine-containing, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
IT
     Polycarbonates, preparation
     Polyoxyalkylenes, preparation
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polyamide-, fluorine-containing, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polyethers, preparation
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polycarbonate-, block, cardo; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
IT
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polyamide-polycarbonate-, block; soluble polyhydroxyamides for
        heat-resistant polyoxazole coating materials for
        electronic components)
     Polyethers, preparation
TT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
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```
PROC (Process)
       (polyamide-polycarbonate-, fluorine-containing, block, cardo; soluble
       polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
    Fluoropolymers, preparation
ΙT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); PRP (Properties); PREP (Preparation);
    PROC (Process)
        (polyamide-polycarbonate-polyether-, block, cardo; soluble
       polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
    Cardo polymers
IT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
    engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polycarbonate-polyether-, fluorine-containing, block; soluble
       polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
     Cardo polymers
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polycarbonate-polyethers, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Cardo polymers
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polycarbonates, block; soluble polyhydroxyamides for
        heat-resistant polyoxazole coating materials for
        electronic components)
     Polyethers, preparation
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polyester-, block, cardo; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Fluoropolymers, preparation
ΙT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polyester-, block; soluble polyhydroxyamides for
        heat-resistant polyoxazole coating materials for
        electronic components)
     Cardo polymers
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
         (polyamide-polyester-polyethers, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
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for electronic components)
    Polycarbonates, preparation
тт
    Polyesters, preparation
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polyether-, block, cardo; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polycarbonates, preparation
IT
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polyamide-polyether-, fluorine-containing, block, cardo; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polyamide-polyoxyalkylene-, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polycarbonates, preparation
TΤ
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, block, cardo; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Polycarbonates, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polyesters, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, fluorine-containing, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
IT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonate-, block, cardo; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonate-, fluorine-containing, block,
        cardo: soluble polyhydroxyamides for heat-
        resistant polyoxazole coating materials for electronic
        components)
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Fluoropolymers, preparation
IT
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonate-polyether-, block, cardo; soluble
       polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
IT
    Cardo polymers
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonate-polyethers, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
IT
     Cardo polymers
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonate-polyethers, fluorine-containing,
        block; soluble polyhydroxyamides for heat-
        resistant polyoxazole coating materials for electronic
        components)
IT
     Cardo polymers
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polycarbonates, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Polyethers, preparation
TT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyester-, block, cardo; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyester-, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Cardo polymers
TT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyester-polyethers, block; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Polycarbonates, preparation
TΤ
     Polyesters, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
         (polybenzoxazole-polyether-, block, cardo; soluble
        polyhydroxyamides for heat-resistant
        polyoxazole coating materials for electronic components)
     Polycarbonates, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
```

```
engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyether-, fluorine-containing, block, cardo;
       soluble polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
    Polyamides, preparation
IΤ
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polycarbonate-, block, cardo; soluble polyhydroxyamides for
       heat-resistant polyoxazole coating materials for
       electronic components)
IT
    Polybenzoxazoles
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polycarbonate-, block, cardo; soluble polyhydroxyamides for
       heat-resistant polyoxazole coating materials for
       electronic components)
IT
    Polyamides, preparation
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polycarbonate-, block; soluble polyhydroxyamides for
        heat-resistant polyoxazole coating materials for
        electronic components)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polycarbonate-, block; soluble polyhydroxyamides for
       heat-resistant polyoxazole coating materials for
        electronic components)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polycarbonate-, fluorine-containing, block; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
IT
     Polyamides, preparation
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
        (polycarbonate-polyether-, block, cardo; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polycarbonate-polyether-, block, cardo; soluble polyhydroxyamides
        for heat-resistant polyoxazole coating materials
        for electronic components)
     Polyamides, preparation
IT
     RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
     engineering or chemical process); PRP (Properties); PREP (Preparation);
     PROC (Process)
```

(polycarbonate-polyether-, fluorine-containing, block, cardo; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Polybenzoxazoles IT RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polycarbonate-polyether-, fluorine-containing, block, cardo; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) IT Polyamides, preparation RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); PREP (Preparation); PROC (Process) (polyester-, fluorine-containing, block; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Polybenzoxazoles IT RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyester-, fluorine-containing, block; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Polyamides, preparation IT RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); PREP (Preparation); PROC (Process) (polyester-polyether-, block, cardo; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Polybenzoxazoles ΙT RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyester-polyether-, block, cardo; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Polyamides, preparation TT RL: IMF (Industrial manufacture); PREP (Preparation) (polyoxyalkylene-, fluorine-containing, block; soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components) Electric insulators IT Electronic packages Electronic packaging materials Electronic packaging process Heat-resistant materials

Interconnections, electric

(soluble polyhydroxyamides for heat-resistant polyoxazole coating materials for electronic components)

IT Polyamides, preparation

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); PREP (Preparation); PROC (Process)

```
(soluble polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
    Polybenzoxazoles
ΙT
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (soluble polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
ΙT
    7440-21-3, Silicon, miscellaneous
    RL: MSC (Miscellaneous)
        (nitride-coated, wafers; soluble polyhydroxyamides for
       heat-resistant polyoxazole coating materials for
       electronic components)
    12033-62-4, Tantalum nitride 25583-20-4, Titanium nitride
IT
    RL: MSC (Miscellaneous)
       (silicon wafers coated by; soluble polyhydroxyamides for
       heat-resistant polyoxazole coating materials for
       electronic components)
                   470465-02-2P 470465-04-4P
    470465-01-1P
                                              470465-05-5P
IT
    470465-06-6P 470465-07-7P 470465-08-8P 470465-09-9P
    470465-10-2P 470465-11-3P 470478-06-9P
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
     (Physical, engineering or chemical process); PRP (Properties); PREP
     (Preparation); PROC (Process)
        (soluble polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
    470465-12-4P 470465-13-5P 470465-14-6P 470465-15-7P
ΤТ
    470465-16-8P
    RL: IMF (Industrial manufacture); PREP (Preparation)
       (soluble polyhydroxyamides for heat-resistant
       polyoxazole coating materials for electronic components)
L30 ANSWER 25 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                      2002:716885 CAPLUS
DOCUMENT NUMBER:
                       137:240773
TITLE:
                      Method for producing a porous polymer
                      coating for electronic devices
INVENTOR(S):
                       Sezi, Recai
PATENT ASSIGNEE(S):
                     Germany
                       U.S. Pat. Appl. Publ., 8 pp.
SOURCE:
                       CODEN: USXXCO
                       Patent
DOCUMENT TYPE:
LANGUAGE:
                       English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                       APPLICATION NO. DATE
    PATENT NO.
                 KIND DATE
     ______
                                        -----
    US 2002132061 A1 20020919
                                        US 2002-98845 20020314
    DE 10112561
                     A1 20021002
                                        DE 2001-10112561 20010315
                     C2 20031218
    DE 10112561
                                     DE 2001-10112561 A 20010315
PRIORITY APPLN. INFO.:
    The present invention relates to a simple and reproducible process for
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producing a organic polymer porous layer which strongly adheres to a
substrate, which comprises the steps: (a) preparation of a composition
comprising an organic polymer constituent and an inorg.-organic constituent
and/or an inorg. constituent, (b) application of this composition to a
substrate and formation of a layer on the substrate, and (c) removal of
the inorg.-organic constituent and/or the inorg. constituent from the layer
to form a porous layer adhering to the substrate.

IT 459451-70-8P 459451-72-0P

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP

(Preparation); PROC (Process)

(in method for **producing** porous polymer coating for electronic devices)

RN 459451-70-8 CAPLUS

1,4-Benzenedicarbonyl dichloride, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and 4,4'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[butanoyl chloride] (9CI) (CA INDEX NAME)

CM

CN

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 2

CRN 45232-94-8 CMF C12 H24 C12 O3 Si2

CM :

CRN 100-20-9 CMF C8 H4 Cl2 O2

RN 459451-72-0 CAPLUS

CN 1,4-Benzenedicarbonyl dichloride, polymer with dihydro-2(3H)-furanone and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 2

CRN 100-20-9 CMF C8 H4 Cl2 O2

CM 3

CRN 96-48-0 CMF C4 H6 O2

IC ICM C23C014-02

ICS B05D005-00

NCL 427534000

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 35, 38

ST porous polymer adherent coating electronics

IT Polymers, uses

RL: TEM (Technical or engineered material use); USES (Uses) (co-; in method for producing porous polymer coating for electronic devices)

IT Porous materials

(films; method for **producing** porous polymer adherent coating for electronic devices)

IT Amides, uses

RL: TEM (Technical or engineered material use); USES (Uses) (hydroxy, polymers; in method for producing porous polymer coating for electronic devices)

IT Drying Etching

TT

IT

TТ

ፐጥ

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Heat treatment
    Plasma
    Surfactants
       (in method for producing porous polymer coating for
       electronic devices)
    Alcohols, processes
    RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical,
    engineering or chemical process); PROC (Process); USES (Uses)
        (in method for producing porous polymer coating for
       electronic devices)
    Noble gases, uses
    RL: NUU (Other use, unclassified); USES (Uses)
        (in method for producing porous polymer coating for
       electronic devices)
    Polysiloxanes, processes
    RL: PEP (Physical, engineering or chemical process); PYP (Physical
    process); SPN (Synthetic preparation); TEM (Technical or engineered
    material use); PREP (Preparation); PROC (Process); USES (Uses)
        (in method for producing porous polymer coating for
       electronic devices)
    Acrylic polymers, processes
    Chlorides, processes
    Epoxy resins, processes
    Fluorides, processes
    Hydroxides (inorganic)
    RL: PEP (Physical, engineering or chemical process); PYP (Physical
    process); TEM (Technical or engineered material use); PROC (Process); USES
        (in method for producing porous polymer coating for
        electronic devices)
    Metallocenes
    Organometallic compounds
    Polybenzimidazoles
      Polybenzoxazoles
    Polvethers, uses
    Polyimides, uses
    Polyoxadiazoles
    Polyquinolines
    Polyguinoxalines
    Silanes
    Silicates, uses
    RL: TEM (Technical or engineered material use); USES (Uses)
        (in method for producing porous polymer coating for
        electronic devices)
    Dielectric films
ΙT
    Electronic packages
    Logic circuits
    Nonvolatile memory devices
    Printed circuit boards
     Semiconductor memory devices
        (method for producing porous polymer coating for electronic
        devices)
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IT
     Computers
        (microprocessors; method for producing porous polymer coating
        for electronic devices)
IT
        (plasma; in method for producing porous polymer coating for
        electronic devices)
     Films
_{
m IT}
        (porous; method for producing porous polymer adherent coating
        for electronic devices)
IΤ
     Coating process
        (spin; in method for producing porous polymer coating for
        electronic devices)
     56-23-5, Carbon tetrachloride, processes 75-46-7, Trifluoromethane
IT
     75-73-0, Carbon fluoride (CF4) 100-20-9, Terephthaloyl dichloride
     2469-55-8, 1,3-Bis(3-aminopropyl)tetramethyldisiloxane 7647-01-0,
     Hydrochloric acid, processes 7664-39-3, Hydrofluoric acid, processes
     7782-41-4, Fluorine, processes 7782-44-7, Oxygen, processes 7782-50-5,
     Chlorine, processes 10294-34-5, Boron chloride (BCl3) 45232-94-8
     359642-31-2
     RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical,
     engineering or chemical process); PROC (Process); USES (Uses)
        (in method for producing porous polymer coating for
        electronic devices)
     459451-70-8P 459451-72-0P
IΤ
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); SPN (Synthetic preparation); PREP
     (Preparation); PROC (Process)
        (in method for producing porous polymer coating for
        electronic devices)
     124-38-9, Carbon dioxide, uses 7446-09-5, Sulfur oxide (SO2), uses
ΙT
     RL: NUU (Other use, unclassified); USES (Uses)
        (in method for producing porous polymer coating for
        electronic devices)
TΤ
     9003-53-6, Polystyrene
     RL: PEP (Physical, engineering or chemical process); PYP (Physical
     process); TEM (Technical or engineered material use); PROC (Process); USES
     (Uses)
         (in method for producing porous polymer coating for
        electronic devices)
               553-12-8D, 8,13-Divinyl-3,7,12,17-tetramethyl-21H,23H-porphin-
IT
     512-63-0
     2,18-dipropionic acid, zinc complex 1273-94-5, 1,1'-Diacetylferrocene
     4098-30-0, Dodecamethylcyclohexasilane 7429-90-5, Aluminum, uses
     7429-90-5D, Aluminum, compds. or salts 7439-89-6, Iron, uses
     7439-89-6D, Iron, compds. or salts 7439-89-6D, Iron,
     hexadecafluorophthalocyanine complexes 7439-96-5, Manganese, uses
     7439-96-5D, Manganese, compds. or salts 7440-02-0, Nickel, uses
     7440-02-0D, Nickel, compds. or salts 7440-02-0D, Nickel,
     hexadecafluorophthalocyanine complexes 7440-21-3, Silicon, uses
     7440-21-3D, Silicon, salts 7440-31-5, Tin, uses 7440-31-5D, Tin,
     compds. or salts 7440-31-5D, Tin, naphthalocyanine complexes
     7440-32-6, Titanium, uses 7440-32-6D, Titanium, compds. 7440-42-8,
     Boron, uses 7440-42-8D, Boron, compds. or salts 7440-47-3, Chromium,
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uses 7440-47-3D, Chromium, compds. or salts 7440-48-4, Cobalt, uses
7440-48-4D, Cobalt, compds. or salts 7440-48-4D, Cobalt,
hexadecafluorophthalocyanine complexes 7440-48-4D, Cobalt.
naphthalocyanine complexes 7440-50-8, Copper, uses 7440-50-8D, Copper,
compds. or salts 7440-50-8D, Copper, hexadecafluorophthalocyanine
complexes 7440-50-8D, Copper, naphthalocyanine complexes 7440-55-3,
Gallium, uses 7440-55-3D, Gallium, compds. or salts 7440-56-4,
Germanium, uses 7440-56-4D, Germanium, compds. or salts 7440-62-2,
Vanadium, uses 7440-62-2D, Vanadium, compds. or salts 7440-66-6, Zinc,
     7440-66-6D, Zinc, complex with 8,13-divinyl-3,7,12,17-tetramethyl-
21H, 23H-porphin-2, 18-dipropionic acid 7631-86-9, Silica, uses
12033-89-5, Silicon nitride, uses 13463-67-7, Titania, uses
20543-06-0, Nickel oxalate 23627-89-6D, 2,3-Naphthalocyanine, transition
metal complexes 112243-78-4 112712-64-8 117446-19-2D,
Hexadecafluoro-29H,31H-phthalocyanine, transition metal complexes
129707-63-7
RL: TEM (Technical or engineered material use); USES (Uses)
   (in method for producing porous polymer coating for
   electronic devices)
96-48-0, γ-Butyrolactone 108-94-1, Cyclohexanone, uses 111-90-0,
Diethylene glycol monoethyl ether 112-36-7, Diethylene glycol diethyl
ether 120-92-3, Cyclopentanone 127-19-5, Dimethylacetamide 872-50-4,
N-Methylpyrrolidone, uses 14272-48-1 84540-57-8, Methoxypropyl acetate
RL: NUU (Other use, unclassified); USES (Uses)
   (solvent; in method for producing porous polymer coating for
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L30 ANSWER 26 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

electronic devices)

2002:686571 CAPLUS

DOCUMENT NUMBER:

137:218062

TITLE:

IT

Insulation films for semiconductor devices with good

heat and moisture resistance and benzoxazole ring-formable polyamide varnishes for their

manufacture

INVENTOR(S):

Oki, Hiromi; Enoki, Naoshi

Sumitomo Bakelite Co., Ltd., Japan PATENT ASSIGNEE(S): Jpn. Kokai Tokkyo Koho, 25 pp.

SOURCE:

CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT: 1 PATENT INFORMATION:

APPLICATION NO. DATE KIND DATE KIND DATE \_\_\_\_\_\_ JP 2001-57435 20010301

JP 2002256146 A2 20020911 PRIORITY APPLN. INFO.:

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PATENT NO.

JP 2001-57435

AB The varnishes contain copolymers (C) of (A) polyamides derived from ethynyl group-containing dicarboxylic acids and other dicarboxylic acids and dihydroxy diamine compds. and (B) oligomers bearing functional groups which can react with functional groups of A, and (D) oligomers (optionally bearing A-reactive groups). Thus, adding 4-ethynyl-2,6naphthalenedicarboxylic dichloride 27.7 to a dissoln. of 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane in N-methyl-2-pyrrolidone (330 mL), mixing at 20° for 1 h, cooling to 10°, adding triethylamine 22.3 and 4-aminobenzoyl ester-terminated styrene oligomer (B) 38.4 g dissolved in \( \gamma\)-butyrolactone (100 mL), mixing for 1 h, filtering, and dropping into a mixture of 6.6 L water and 6.6 L i-PrOH gave a copolymer (C). Mixing 30.0 g the C with 4.9 g the B dissolved in 100 mL N-methyl-2-pyrrolidone, filtering, coating the resulting filtrate on a Si wafer and baking gave a porous coat film having polybenzoxazole structure and dielec. constant 1.96.

405932-06-1P 455281-89-7P, 9,9-Bis[4-[(4-amino-3-hydroxy)phenoxy]phenyl]fluorene-5-ethynylterephthalic chloride-polypropylene glycol bis(2-aminopropyl ether) block copolymer RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

405932-06-1 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $_{0}$ -(2-aminopropoxy) poly [oxy (methyl-1,2-ethanediyl)], 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and 5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride, block (9CI) (CA INDEX NAME)

CM 1

IT

RN

CN

CRN 393543-14-1 CMF C16 H8 Cl2 O2

$$\begin{array}{c}
0 \\
C1-C
\end{array}$$

$$C = C-Ph$$

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2 Page 203 Duc10609460

CM 3

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 4

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

RN 455281-89-7 CAPLUS

CN 1,4-Benzenedicarbonyl dichloride, 2-ethynyl-, polymer with

 $_{\alpha}\text{-}(2\text{-aminopropy})-_{\omega}\text{-}(2\text{-aminopropoxy})\text{poly}[\text{oxy}(\text{methyl-1,2-ethanediyl})] and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol], block (9CI) (CA INDEX NAME)$ 

CM 1

CRN 393543-09-4 CMF C10 H4 C12 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 3

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

IC ICM C08L077-06

ICS C08G073-22; C09D005-25; C09D177-00; C09D179-04; H01B003-30; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

ST low k insulation film semiconductor device polyamide polybenzoxazole crosslinking

IT Dielectric films
Electric insulators

Semiconductor devices

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

IT Polyoxyalkylenes, uses

RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-; insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

T Polyamides, uses

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polybenzoxazole-; insulation films for semiconductor devices
with good heat and moisture resistance and hydroxy group-containing
polyamide varnishes for manufacture)

IT 405931-95-5P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-4-ethynyl-2,6-naphthalenedicarboxylic acid dichloride-styrene block copolymer 405931-96-6P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-ethylene oxide-5-ethynylterephthalic chloride-propylene oxide block copolymer 405932-02-7P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-5-phenylethynylisophthalic dichloride-polypropylene glycol bis(2-aminopropyl ether) block copolymer 405932-03-8P 405932-04-9P 405932-06-1P 455281-89-7P, 9,9-Bis[4-[(4-amino-3-hydroxy)phenoxy]phenyl]fluoren e-5-ethynylterephthalic chloride-polypropylene glycol bis(2-aminopropyl ether) block copolymer 455281-90-0P RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP

.

(Preparation); USES (Uses)

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for

9003-53-6DP, Polystyrene, hydroxy-terminated, esters with aminobenzoic TT acid 163845-57-6P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

9011-14-7, PMMA 9046-10-0, Polypropylene glycol bis(2-aminopropyl ether) TT 25322-69-4, Polypropylene glycol 106392-12-5, Ethylene oxide-propylene oxide block copolymer

RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(insulation films for semiconductor devices with good heat and moisture resistance and hydroxy group-containing polyamide varnishes for manufacture)

L30 ANSWER 27 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

2002:650053 CAPLUS ACCESSION NUMBER:

137:186672 DOCUMENT NUMBER:

Polyamide-based copolymers for insulator films, their TITLE: coating varnishes, and porous insulator films thereof

Saito, Hidenori; Enoki, Naoshi INVENTOR(S):

Sumitomo Bakelite Co., Ltd., Japan PATENT ASSIGNEE(S): Jpn. Kokai Tokkyo Koho, 18 pp. SOURCE:

CODEN: JKXXAF

DOCUMENT TYPE: Patent

PATENT NO. KIND DATE

Japanese LANGUAGE:

FAMILY ACC. NUM. COUNT: 1 PATENT INFORMATION:

\_\_\_\_\_ \_\_\_\_\_ JP 2001-370655 20011204 JP 2002241503 A2 20020828 JP 2000-371396 A 20001206 PRIORITY APPLN. INFO.: AB The copolymers for giving heat-resistant insulator films in semiconductor devices, are obtained by reacting polyamides having repeating units [NHX(OR1)(OR2)NHCOY1CO]m[NHX(OR3 )(OR4)NHCOY2CO]n (R1-R4 = H, monovalent organic group; X = tetravalent aromatic group selected from described groups; Y1, Y2 = divalent group selected from described groups; m > 0;  $n \ge 0$ ; m + n = 2-1000; m/(m + n) = 00.05-1) with reactive oligomers having norbornene structure and substitution groups reactive to CO2H, NH2, or OH in the polyamides The insulator films having micropores and polybenzoxazole -based structure are obtained by heating the varnishes containing the above copolymers and organic solvents for condensation or crosslinking. Thus, 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane was reacted with

4-ethynyl-2,6-naphthalenedicarboxylic acid chloride and then with 1-aminopropylnorbornene oligomer to give a copolymer, whose solution was

APPLICATION NO. DATE

<05/14/2004> KOROMA - EIC 1700

applied on a wafer and heated to give a porous film showing average pore diam 15 nm, glass transition temperature  $542^{\circ}$ , dielec. constant at 1 MHz 2.54, and water absorption 0.2%.

450408-24-9DP, reaction products with norbornene derivs.

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses) (polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

RN 450408-24-9 CAPLUS

2,6-Naphthalenedicarbonyl dichloride, 4-ethynyl-, polymer with 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM :

CN

CRN 405931-94-4 CMF C14 H6 Cl2 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

TC TCM C08G081-00

ICS C08G069-48; C09D177-00; H01B003-30; H01L021-312

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

ST bisaminohydroxyphenylhexafluoropropane ethynylnaphthalenedicarboxylic chloride aminopropylnorbornene copolymer insulator; polyamide norbornene oligomer copolymer insulator film; polybenzoxazole porous insulator film polyamide copolymer varnish

IT Heat-resistant materials

(films; polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

IT Films

(heat-resistant; polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

IT Polyamides, processes

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process) (norbornene-containing; polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-; polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

IT Dielectric films

(polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

IT Polyamides, uses

TT

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polybenzoxazole-; polyamide-norbornene oligomer copolymers for porous insulator films with polybenzoxazole structure)

393543-10-7DP, reaction products with norbornene derivs.

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393543-15-2DP, reaction products with norbornene derivs.
    450408-23-8DP, reaction products with norbornene derivs.
    450408-24-9DP, reaction products with norbornene derivs.
    450408-25-0DP, reaction products with norbornene derivs.
    RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
    (Physical, engineering or chemical process); TEM (Technical or engineered
    material use); PREP (Preparation); PROC (Process); USES (Uses)
        (polyamide-norbornene oligomer copolymers for porous insulator films
       with polybenzoxazole structure)
L30 ANSWER 28 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                       2002:592080 CAPLUS
ACCESSION NUMBER:
DOCUMENT NUMBER:
                       137:141504
TITLE:
                        Heat-resistant coating varnishes
                        with low dielectric constant containing
                        polybenzoxazole precursors and their
                        insulating films with micropores
                        Saito, Hidenori; Enoki, Naoshi
INVENTOR (S):
                       Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 20 pp.
SOURCE:
                        CODEN: JKXXAF
                        Patent
DOCUMENT TYPE:
                        Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                        APPLICATION NO. DATE
                 KIND DATE
    PATENT NO.
                                         _____
     -----
                                         JP 2001-16404 20010124
                     A2 20020809
    JP 2002220564
PRIORITY APPLN. INFO.:
                                      JP 2001-16404
                                                         20010124
    The coating varnishes contain polyamides having
     [NHX (OR1) (OR2) NHCOY1CO] m [NHX (OR3) (OR4) NHCOY2CO] n [m >0, n \geq0, 2
    \leq (m + n) \leq 1000, 0.05 \leq m/(m + n) \leq 1; R1-R4
     = H, monovalent organic group; X = benzenetetrayl, biphenyltetrayl, etc.,; Y1
     = divalent ethynyl-containing aromatic, ethynyl-containing aliphatic ring,
biphenylene
     residue, tolan residue, etc.,; Y2 = benzenediyl, divalent substituted
     fluorene, etc.,], oligomers or polymers (NHZNHCOY3CO)o or (OZO2CY3CO)p (o,
     p \ge 1; Z = polyalkylene glycol residue; Y3 = divalent ethynyl-containing
     aromatic, ethynyl-containing aliphatic ring, biphenylene residue, tolan
residue,
     fluorene residue, etc.,), and organic solvents. Thus,
     polybenzoxazole precursor prepared from
     2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane and 5-
     ethynylterephthaloyl chloride, an oligomeric material prepared
     from polypropylene glycol and isophthaloyl chloride, and
     N-methyl-2-pyrrolidone were filtrated through Teflon filter to give a
     coating varnish. The coating varnish was applied on a substrate and cured
     to give a heat-resistant film showing dielec
     . constant 2.3, Tg >450°, water absorption 0.3%, and micropore size
     <20 nm.
IT
    444922-65-0P
```

RL: IMF (Industrial manufacture); POF (Polymer in formulation);
RCT (Reactant); TEM (Technical or engineered material use); PREP
(Preparation); RACT (Reactant or reagent); USES (Uses)
 (heat-resistant coating varnishes with low
 dielec. constant containing polybenzoxazole precursors and
 their insulating films with micropores)

RN 444922-65-0 CAPLUS
CN 1,4-Benzenedicarbonyl dichloride, 2-ethynyl-, polymer with
 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI)
 (CA INDEX NAME)

CM 1

CRN 393543-09-4

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CMF C10 H4 C12 O2

IC ICM C09D177-00

ICS C08F299-02; C08G069-32; C08G073-22; C09D005-25; C09D167-02; C09D171-00: H01B003-30

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST coating insulating film polybenzoxazole heat resistant; isophthaloyl polypropylene glycol copolymer insulating film; polyamide micropore polybenzoxazole precursor insulating film

IT Heat-resistant materials

(films; heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores)

IT Dielectric films

(heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores)

IT Polyamides, uses
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
 (Reactant); TEM (Technical or engineered material use); PREP
 (Preparation); RACT (Reactant or reagent); USES (Uses)

(heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and

their insulating films with micropores)

IT Polymer blends

RL: TEM (Technical or engineered material use); USES (Uses) (heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and

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their insulating films with micropores)
IT
    Films
        (heat-resistant; heat-resistant
       coating varnishes with low dielec. constant containing
       polybenzoxazole precursors and their insulating films with
       micropores)
IT
    Polyethers, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-, aromatic, fluorene group-containing, cardo; heat-
       resistant coating varnishes with low dielec. constant
       containing polybenzoxazole precursors and their insulating films
       with micropores)
IT
    Polyoxyalkylenes, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyamide-; heat-resistant coating varnishes with
        low dielec. constant containing polybenzoxazole
       precursors and their insulating films with micropores)
IT
    Cardo polymers
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (polyamide-polyethers, aromatic, fluorene group-containing; heat-
       resistant coating varnishes with low dielec. constant
       containing polybenzoxazole precursors and their insulating films
       with micropores)
IT
    Polyethers, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, cardo; heat-resistant
       coating varnishes with low dielec. constant containing
       polybenzoxazole precursors and their insulating films with
       micropores)
IT
    Cardo polymers
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyether-; heat-resistant
       coating varnishes with low dielec. constant containing
       polybenzoxazole precursors and their insulating films with
       micropores)
IT
    Polyoxyalkylenes, uses
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyester-; heat-resistant coating varnishes with
       low dielec. constant containing polybenzoxazole
       precursors and their insulating films with micropores)
    Polyamides, uses
IT
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
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IT

IT

IT

TT

(polyether-, aromatic, fluorene group-containing, cardo; heatresistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores) Polybenzoxazoles RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, cardo; heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores) Polyamides, uses Polyesters, uses RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyoxyalkylene-; heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores) 393543-10-7P 444922-64-9P 444922-65-0P 445041-09-8P 445041-18-9P RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses) (heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores) 444922-60-5P 444922-61-6P 444922-62-7P 444922-63-8P 85389-27-1P 444922-67-2P RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (heat-resistant coating varnishes with low dielec. constant containing polybenzoxazole precursors and their insulating films with micropores) L30 ANSWER 29 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN ACCESSION NUMBER: 2002:423001 CAPLUS DOCUMENT NUMBER: 137:7182 Heat- and water-resistant polyamide compositions and their porous polybenzoxazole electric insulator films

TITLE:

Oki, Hiromi; Hase, Yoko; Enoki, Naoshi INVENTOR(S): PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF Patent

DOCUMENT TYPE:

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002161204	A2	20020604	JP 2001-262440	20010830

PRIORITY APPLN. INFO.:

JP 2000-263323 A 20000831

III

GΙ

II

AB The compns. comprise oligomers and polyamides manufactured from (A) diaminophenols (H2N)2X(OH)2 [X = 1,2,4,5-benzenetetray1, 2,2',3,3'-biphenyltetray1, QZQ, I; Q = 1,3,4-benzenetriy1, Z = 0, SO2, CMe2, C(CF3)2, phenylene, oxyphenylenoxy, II, etc.], (B) compds. having d-valent organic groups reactive to amino groups of A (d = 3-10), and (C) dicarboxylic acids HO2CYCO2H (Y = III, m-phenylene, p-phenylene, biphenylene, naphthalenediy1, etc.). Thus, 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane-2,6-biphenylene dicarboxylic acid chloride-isophthaloyl chloride-trimesic acid trichloride copolymer was mixed with polymethyl methacrylate and a solvent, applied on a glass plate, and heated to give a polybenzoxazole film showing pore size ≤5 nm, dielec. constant 2.4, Tg 414°, and water absorption 0.2%.

IT 433304-98-4P, 9,9-Bis[4-(4-amino-3-hydroxyphenoxy)phenyl]fluorene2,7-biphenylene dicarboxylic acid chloride-trimesic acid trichloride
copolymer

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide compns. for heat- and water-resistant porous polybenzoxazole elec. insulator films)

RN 433304-98-4 CAPLUS

1,3,5-Benzenetricarbonyl trichloride, polymer with 2,7-biphenylenedicarbonyl dichloride and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM I

CN

CRN 359642-31-2

## CMF C37 H28 N2 O4

CM 2

CRN 69417-81-8 CMF C14 H6 C12 O2

CM 3

CRN 4422-95-1 CMF C9 H3 C13 O3

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IC
     ICM C08L077-06
     ICS C08G069-26; C08G073-22; C08L101-00; C09D005-25; C09D179-04;
          H01L021-312
CC
     38-3 (Plastics Fabrication and Uses)
     Section cross-reference(s): 76
ST
     polybenzoxazole porous insulator film heat
     resistance; polyamide polybenzoxazole elec
     insulator water resistance
IT
     Polycarbonates, uses
     Polyoxyalkylenes, uses
     Polyurethanes, uses
     RL: NUU (Other use, unclassified); POF (Polymer in formulation); REM
     (Removal or disposal); PROC (Process); USES (Uses)
        (heat-decomposed to form micropores; polyamide compns. for heat- and
        water-resistant porous polybenzoxazole elec.
        insulator films)
    Dielectric films
TT
        (polyamide compns. for heat- and water-resistant porous
        polybenzoxazole elec. insulator films)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyamide compns. for heat- and water-resistant porous
       polybenzoxazole elec. insulator films)
IT
     Polyamides, uses
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PREP
     (Preparation); USES (Uses)
        (thermal ring closure for polybenzoxazoles; polyamide compns.
        for heat- and water-resistant porous polybenzoxazole
        elec. insulator films)
TТ
     9003-11-6, Ethylene oxide-propylene oxide copolymer
                                                           9003-53-6,
     Polystyrene 9011-14-7, Polymethyl methacrylate 25322-69-4,
     Polypropylene glycol 25718-55-2, Polyethylene carbonate
                                                                 66536-59-2
     RL: NUU (Other use, unclassified); POF (Polymer in formulation); REM
     (Removal or disposal); PROC (Process); USES (Uses)
        (heat-decomposed to form micropores; polyamide compns. for heat- and
       water-resistant porous polybenzoxazole elec.
        insulator films)
     433304-97-3P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-2,6-
IT
    biphenylene dicarboxylic acid chloride-isophthaloyl chloride-trimesic acid
     trichloride copolymer 433304-98-4P, 9,9-Bis[4-(4-amino-3-
    hydroxyphenoxy)phenyl]fluorene-2,7-biphenylene dicarboxylic acid
    chloride-trimesic acid trichloride copolymer 433304-99-5P,
     3,3',5,5'-Biphenyltetracarbonyl tetrachloride-2,2-bis(3-amino-4-
    hydroxyphenyl)hexafluoropropane-2,6-biphenylene dicarboxylic acid
     chloride-isophthaloyl chloride copolymer
    RL: IMF (Industrial manufacture); POF (Polymer in formulation);
     PRP (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamide compns. for heat- and water-resistant porous
       polybenzoxazole elec. insulator films)
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L30 ANSWER 30 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:368077 CAPLUS

DOCUMENT NUMBER: 136:370772

TITLE: Polyamide compositions and electrically

insulating microporous film obtained from the

-----

compositions for electronic devices

INVENTOR(S): Oki, Hiromi; Enoki, Naoshi; Hase, Yoko
PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

\_\_\_\_

CODEN: JKXXAF

DOCUMENT TYPE: Patent LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

JP 2002141344 A2 20020517 JP 2000-331231 20001030 PRIORITY APPLN. INFO.: JP 2000-331231 20001030

GI

$$Q^{1} = Q^{2} = Z$$

$$Q^{3} = Z$$

$$Q^{4} = Q^{5} = Q^{5} = Q^{5}$$

AB The compns. contain (A) polyamides obtained by reaction of H2NX(OH)2NH2 [X = Q1-Q5; Z = 0, SO2, CMe2, C(CF3)2, divalent aromatic substituents], compds. having d-valent amino-reactive organic groups (d = 3-10), HO2CYCO2H (Y = 1,3-phenylene, 1,4-phenylene, biphenylene, C6H4ZC6H4, naphthylene), and HO2CC6H4C.tplbond.CC6H4CO2H, and (B) oligomers. The elec. insulating films have a microporous polymer layer with benzoxazole structure obtained by condensation and crosslinking of the above composition under heat. Thus, a varnish containing

parts polyamide [prepared from 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane, trimesic acid trichloride, isophthaloyl dichloride, and 4,4'-tolandicarboxylic acid dichloride] and 5 parts poly(Me methacrylate) in 195 parts NMP was applied on a glass sheet and heated at 70-420° for 4.5 h to give a 10- $\mu m$  microporous film with pore size  $\leq 5$  nm, dielec. constant 2.3, Tg 310°, and moisture absorption 0.3%.

IT 423754-47-6P 423754-48-7P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation);
 TEM (Technical or engineered material use); PREP (Preparation);
 USES (Uses)

(polyamide compns. for elec. insulating microporous films with good heat and water resistance for electronic devices)

423754-47-6 CAPLUS

1,3,5-Benzenetricarbonyl trichloride, polymer with 1,3-benzenedicarbonyl dichloride, 3-[[4-(chlorocarbonyl)phenyl]ethynyl]benzoyl chloride and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

RN

CN

CRN 393543-17-4 CMF C16 H8 Cl2 O2

$$c_{1-c} = c$$

$$c = c$$

$$c = c$$

$$c = c$$

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4 Page 219 Duc10609460

CM 3

CRN 4422-95-1 CMF C9 H3 Cl3 O3

CM 4

CRN 99-63-8 CMF C8 H4 Cl2 O2

$$\begin{array}{c|c} & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & &$$

RN 423754-48-7 CAPLUS

CN 1,3,5-Benzenetricarbonyl trichloride, polymer with 3-[[4-

(chlorocarbonyl)phenyl]ethynyl]benzoyl chloride and 3,3'-[9H-fluoren-9ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393543-17-4 CMF C16 H8 Cl2 O2

ČM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CM 3

CRN 4422-95-1 CMF C9 H3 Cl3 O3

IC ICM H01L021-312

ICS C08G073-10; C08L079-08; H01B003-30; H01L021-768

CC 38-3 (Plastics Fabrication and Uses)
 Section cross-reference(s): 37, 76

ST polyamide polybenzoxazole elec insulator film porous; aminohydroxyphenyl fluoropropane isophthalate tolandicarboxylate trimesate polymer insulator film; heat water resistance dielec film polyamide polybenzoxazole

IT Water-resistant materials

(heat-resistant; polyamide compns. for elec

. insulating microporous films with good heat and water resistance for electronic devices)

IT Electric insulators

(polyamide compns. for elec. insulating microporous films with good heat and water resistance for electronic devices)

IT Polyoxyalkylenes, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(polyamide compns. for **elec.** insulating microporous films with good heat and water resistance for electronic devices)

IT Polybenzoxazoles

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-; polyamide compns. for elec. insulating microporous films with good heat and water resistance for electronic

devices)
TT Polvamides, uses

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polybenzoxazole-; polyamide compns. for elec.

insulating microporous films with good heat and water resistance for electronic devices)

IT Heat-resistant materials

(water-resistant; polyamide compns. for **elec**. insulating microporous films with good heat and water resistance for electronic devices)

IT 393543-19-6P 423754-46-5P 423754-47-6P 423754-48-7P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation);
 TEM (Technical or engineered material use); PREP (Preparation);
 USES (Uses)

(polyamide compns. for elec. insulating microporous films
with good heat and water resistance for electronic devices)

IT 9003-11-6, Ethylene oxide-propylene oxide copolymer 9003-53-6,
Polystyrene 9011-14-7, Poly(methyl methacrylate) 25322-69-4,
Polypropylene oxide
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(polyamide compns. for elec. insulating microporous films

with good heat and water resistance for electronic devices)

L30 ANSWER 31 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2002:240862 CAPLUS

DOCUMENT NUMBER:

136:280417

TITLE:

Polyamide-containing material for insulating film, coating varnish for insulating film, and insulating

APPLICATION NO. DATE

coating varnish for insulating film, and insulating film and semiconductor device using the same

Enoki, Takashi; Saito, Hidenori; Higashida, Nobuhiro;

INVENTOR(S): Enoki, Takashi Ishida, Yuichi

PATENT ASSIGNEE(S):

Sumitomo Bakelite Company, Ltd., Japan

SOURCE:

PCT Int. Appl., 64 pp.

CODEN: PIXXD2

DOCUMENT TYPE:

Patent

KIND DATE

LANGUAGE: January Acc. Num. COUNT: 1

Japanese

PATENT INFORMATION:

PATENT NO.	KIND DAID		
WO 2002024788	A1 20020328	WO 2001-JP8210	20010920
W: CN, KR,	SG, US		
RW: AT, BE,	CH, CY, DE, DK,	ES, FI, FR, GB, GR, IE,	IT, LU, MC, NL,
PT, SE,	TR		
JP 2002167442	A2 20020611	JP 2000-401237	20001228
JР 3492316	B2 20040203		
EP 1333050	A1 20030806	EP 2001-967765	20010920
R: AT, BE,	CH, DE, DK, ES,	FR, GB, GR, IT, LI, LU,	NL, SE, MC, PT,
IE, FI,	CY, TR		
US 2004002572	A1 20040101	US 2003-380872	20030319
PRIORITY APPLN. INFO		JP 2000-288271 A	20000922
PRIORITY APPEN. INFO	• •	JP 2000-401237 A	20001228
		WO 2001-JP8210 W	20010920

The invention relates to a material for an insulating film, characterized in that it comprises a copolymer prepared by reacting a HO-containing polyamide having a specific structure (e.g., ethynyl) and a reactive oligomer as a film forming component; a coating vanish for an insulating film which comprises the material and an organic solvent; an insulating film, characterized in that it comprises a layer of a resin having polybenzoxazole as a primary structure which is prepared by heating the material or the coating vanish to allow to undergo a condensation reaction and a crosslinking reaction, and has micropores; and a semiconductor device which has an inter-layer insulating film for multi-layer wiring and/or a surface protecting layer comprising the

insulating film. The material for an insulating film is excellent in elec. characteristics, thermal characteristics, mech. characteristics and the like, and also can be used for producing an insulating film having a reduced dielec. constant Thus, adding 4-ethynyl-2,6-naphthalenedicarboxylic acid dichloride 27.7 to a solution of 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane 35.9 in dry N-methyl-2-pyrrolidone (330 mL) at 10°, after 1 h at 10°, mixing for 1 h at 20°, cooling back to 10°, adding Et3N 22.3, y-butyrolactone (100 mL) and 4-aminobenzoate ester of a OH-terminated styrene oligomer (preparation given) 38.4 g, after 1 h at 10°, mixing for 1 h at 20° and working up gave a copolymer 5.00 g of which was dissolved in 20.00 g N-methyl-2-pyrrolidone, filtered, coated on an Al-deposited Si wafer and heated initially at 120° for 240 s then at 300° under an atmospheric containing <100 ppm O for 60 min, and at 400° for 60 min to decompose the oligomer unit to give a polybenzoxazole resin film with micro-pores, dielec. constant 2.1, and good resistance to heat and moisture. 405931-98-8P 405932-05-0P 405932-06-1P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same)

RN 405931-98-8 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with α-(2-aminopropyl)-ω-(2-aminopropoxy)poly[oxy(methyl-1,2ethanediyl)] and 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6aminophenol], block (9CI) (CA INDEX NAME)

CM I

CRN 393543-05-0 CMF C10 H4 Cl2 O2

CM 2

CRN 359642-31-2 CMF C37 H28 N2 O4

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

RN 405932-05-0 CAPLUS
CN 1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with
α-(2-aminopropyl)-ω-(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,3-benzenedicarbonyl dichloride, 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and 5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride, block (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1 CMF C16 H8 Cl2 O2

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 3

CRN 359642-31-2 CMF C37 H28 N2 O4

CRN 26403-64-5 CMF (C3 H6 O)n C6 H16 N2 O CCI IDS, PMS

$$\begin{array}{c|c} & \text{NH2} \\ \text{Me-CH-CH}_2 - \text{O} & - & \text{CC}_3 \text{H6}) - \text{O} & - & \text{CH}_2 - \text{CH-Me} \end{array}$$

CM 5

CRN 99-63-8 CMF C8 H4 Cl2 O2

CN

RN 405932-06-1 CAPLUS

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with  $\alpha$ -(2-aminopropyl)- $\omega$ -(2-aminopropoxy)poly[oxy(methyl-1,2-ethanediyl)], 3,3'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[6-aminophenol] and 5-(phenylethynyl)-1,3-benzenedicarbonyl dichloride, block (9CI) (CA INDEX NAME)

CRN 393543-14-1 CMF C16 H8 C12 O2

CM 2

CRN 393543-05-0 CMF C10 H4 C12 O2

CM 3

CRN 359642-31-2 CMF C37 H28 N2 O4

CRN 26403-64-5

CMF (C3 H6 O)n C6 H16 N2 O

CCI IDS, PMS

$$^{\mathrm{NH_2}}$$
 $^{\mathrm{NH_2}}$ 
 $^{\mathrm{NH_2}}$ 
 $^{\mathrm{NH_2}}$ 
 $^{\mathrm{NH_2}}$ 
 $^{\mathrm{CH_2-CH_2-O}}$ 
 $^{\mathrm{CH_2-CH_2-OH_2-OH_2}}$ 

IC ICM C08G081-00

ICS H01L021-312; H01L021-762; H05K003-28; H05K003-46

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 42, 76

ST low k material ethynyl naphthalenedicarboxylic acid polyamide polybenzoxazole compn; semiconductor device dielec film polybenzoxazole resin heat moisture resistance; aminobenzoate ester styrene oligomer pore former low k material

IT Polyamides, uses

RL: IMF (Industrial manufacture); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(crosslinked; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor

device using same)
T Polybenzoxazoles

IT Polybenzoxazoles
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or

engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; polyamide-containing material for insulating film, coating
 varnish for insulating film, and insulating film and semiconductor

device using same) IT Polyoxyalkylenes, uses RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-, block; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same) IT Dielectric films Heat-resistant materials Semiconductor devices Water-resistant materials (polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using TΤ Polyoxyalkylenes, uses RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polybenzoxazole-, block; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same) Polyamides, uses IT Polybenzoxazoles RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyoxyalkylene-, block; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same) 23351-91-9P, 5-Bromoisophthalic acid 51760-21-5P, Dimethyl IT 16882-08-9P 65235-38-3P 65235-40-7P 65235-41-8P 5-bromoisophthalate 217655-36-2P 393543-03-8P 393543-04-9P 168619-21-4P RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (intermediate; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same) 16819-44-6P, 4,4'-Tolandicarboxylic acid dichloride 69417-81-8P, IT 2,7-Biphenylenedicarbonyl dichloride 393543-05-0P 393543-08-3P 393543-14-1P 405931-94-4P RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (monomer; polyamide-containing material for insulating film, coating varnish for insulating film, and insulating film and semiconductor device using same) TT 405931-96-6P RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyamide-containing material for insulating film, coating varnish for

insulating film, and insulating film and semiconductor device using

405931-95-5P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane;4-ethynyl-

2,6-naphthalenedicarboxylic acid dichloride; styrene block copolymer

same)

IT

```
405931-98-8P 405932-00-5P 405932-02-7P 405932-03-8P
    405932-04-9P 405932-05-0P 405932-06-1P 405932-07-2P
    405932-08-3P 405932-09-4P
    RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (polyamide-containing material for insulating film, coating varnish for
       insulating film, and insulating film and semiconductor device using
    122-04-3DP, 4-Nitrobenzoic acid chloride, ester products with
IT
    hydroxy-terminated oligomers, reduction product
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-containing material for insulating film, coating varnish for
        insulating film, and insulating film and semiconductor device using
        same)
    7553-56-2, Iodine, reactions 7719-09-7, Thionyl chloride 10035-10-6,
ΙT
     Hydrobromic acid, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (polyamide-containing material for insulating film, coating varnish for
        insulating film, and insulating film and semiconductor device using
        same)
     115-19-5, 3-Methyl-1-butyn-3-ol 358-23-6, Trifluoromethanesulfonic acid
IT
     anhydride 13036-02-7, Dimethyl 5-hydroxyisophthalate
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reactant for monomer; polyamide-containing material for insulating film,
        coating varnish for insulating film, and insulating film and
        semiconductor device using same)
     99-31-0, 5-Aminoisophthalic acid 536-74-3, Phenylacetylene 619-42-1,
ΤT
     Methyl 4-bromobenzoate 792-74-5, Dimethyl 4,4'-biphenyldicarboxylate
     3034-86-4, Methyl 4-ethynylbenzoate 9003-13-8, Polypropylene glycol
     monobutyl ether
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reactant; polyamide-containing material for insulating film, coating
        varnish for insulating film, and insulating film and semiconductor
        device using same)
     9003-53-6DP, Polystyrene, hydroxy-terminated, aminobenzoate esters
ΙT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (reactive oligomer; polyamide-containing material for insulating film,
        coating varnish for insulating film, and insulating film and
        semiconductor device using same)
                               THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
REFERENCE COUNT:
                         4
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
L30 ANSWER 32 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                         2002:90640 CAPLUS
ACCESSION NUMBER:
DOCUMENT NUMBER:
                         136:135622
                         Precursor of a heat resistant
TITLE:
                         resin, heat resistant resin,
                         insulating film, and semiconductor device
                         Okanuma, Masako; Yoshida, Tatsuhiro; Saito, Hidenori;
INVENTOR(S):
```

Higashida, Nobuhiro; Fujimoto, Masanori; Ishikawa,

Tadahiro

PATENT ASSIGNEE(S):

Sumitomo Bakelite Company Ltd., Japan

SOURCE:

U.S. Pat. Appl. Publ., 23 pp.

DOCUMENT TYPE:

CODEN: USXXCO Patent

LANGUAGE:

FAMILY ACC. NUM. COUNT: 1

English

PATENT INFORMATION:

IL,
т,

A precursor of a polybenzoxazole resin comprises a crosslinking AB group in a mol. and has a specific structure is obtained by a condensation reaction and crosslinking reaction for production of an insulating film and a semiconductor device having an insulating interlayer film in multi-layer wiring or a film for protecting surfaces which comprises the above insulating film. The precursor exhibits excellent processability due to excellent solubility in solvents and, after ring closure, excellent heat stability in applications. The resin exhibits excellent elec., phys. and mech. properties and is advantageously used for insulating interlayer films of semiconductor devices.

WO 2001-JP8209 W 20010920

393543-20-9P 393543-21-0P ΙT

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(precursor of a heat resistant resin, heat

resistant resin, insulating film, and semiconductor device)

393543-20-9 CAPLUS RN

1,3-Benzenedicarbonyl dichloride, 5-ethynyl-, polymer with CN

3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] and 5-(phenylethynyl)-1,3benzenedicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1

CMF C16 H8 C12 O2

CM 2

CRN 393543-05-0 CMF C10 H4 Cl2 O2

$$\begin{array}{c} 0 \\ \text{C1-C} \\ \\ \text{C-C1} \\ \\ \end{array}$$

CM 3

CRN 152480-72-3 CMF C25 H20 N2 O2

RN 393543-21-0 CAPLUS
CN 1,3-Benzenedicarbonyl dichloride, 5-(phenylethynyl)-, polymer with

1,4-benzenedicarbonyl dichloride, 2-ethynyl-1,4-benzenedicarbonyl dichloride and 3,3'-(9H-fluoren-9-ylidene)bis[6-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 393543-14-1 CMF C16 H8 Cl2 O2

$$c1-C$$

$$C-C1$$

$$0$$

CM 2

CRN 393543-09-4 CMF C10 H4 Cl2 O2

CRN 152480-72-3 CMF C25 H20 N2 O2

CM 4

CRN 100-20-9 CMF C8 H4 C12 O2

```
ICM C08G018-00
IC
NCL 528044000
     37-6 (Plastics Manufacture and Processing)
     Section cross-reference(s): 38, 76
     polybenzoxazole heat resistant insulating
ST
     film semiconductor
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (fluorine-containing, preparation, ring closure and crosslinking,
        precursor; precursor of a heat resistant resin,
        heat resistant resin, insulating film, and
        semiconductor device)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (fluorine-containing; precursor of a heat resistant
        resin, heat resistant resin, insulating film, and
        semiconductor device)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-, preparation, ring closure and crosslinking,
        precursor; precursor of a heat resistant resin,
        heat resistant resin, insulating film, and
        semiconductor device)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; precursor of a heat
        resistant resin, heat resistant resin,
        insulating film, and semiconductor device)
     Electric insulators
ΤТ
       Heat-resistant materials
     Semiconductor devices
         (precursor of a heat resistant resin, heat
        resistant resin, insulating film, and semiconductor device)
     Polybenzoxazoles
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
```

(precursor of a heat resistant resin, heat

```
resistant resin, insulating film, and semiconductor device)
    792-74-5, Dimethyl 4,4'-biphenyldicarboxylate
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (iodation; precursor of a heat resistant resin,
       heat resistant resin, insulating film, and
       semiconductor device)
    3034-86-4P, Methyl 4-ethynylbenzoate 16819-43-5P, 4,4'-Tolandicarboxylic
IT
           16819-44-6P, 4,4'-Tolandicarboxylic acid dichloride
    23351-91-9P, 5-Bromoisophthalic acid 51760-21-5P, Dimethyl
    5-bromoisophthalate 65235-38-3P 65235-40-7P 65235-41-8P
    168619-21-4P 217655-36-2P 393543-03-8P 393543-04-9P 393543-05-0P
    393543-08-3P
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (precursor of a heat resistant resin, heat
       resistant resin, insulating film, and semiconductor device)
    382608-43-7P 382608-44-8P 393543-10-7P 393543-12-9P
                                                              393543-13-0P
TT
    393543-15-2P 393543-16-3P 393543-18-5P 393543-19-6P
    393543-20-9P 393543-21-0P 393543-22-1P 393543-23-2P
    393543-24-3P 393543-25-4P 393543-26-5P 393543-27-6P 393543-28-7P
    393543-29-8P 393588-31-3P 393588-33-5P 393588-40-4P 393588-41-5P
    RL: IMF (Industrial manufacture); TEM (Technical or engineered
     material use); PREP (Preparation); USES (Uses)
        (precursor of a heat resistant resin, heat
        resistant resin, insulating film, and semiconductor device)
     99-31-0, 5-Aminoisophthalic acid 115-19-5, 3-Methyl-1-butyn-3-ol
ΙT
     536-74-3, Phenylacetylene 619-42-1, Methyl 4-bromobenzoate
     Thionyl chloride 10035-10-6, Hydrobromic acid, reactions 62480-31-3
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (precursor of a heat resistant resin, heat
        resistant resin, insulating film, and semiconductor device)
     13036-02-7, Dimethyl 5-hydroxyisophthalate
IT
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (sulfonation; precursor of a heat resistant resin,
        heat resistant resin, insulating film, and
        semiconductor device)
L30 ANSWER 33 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
                        2001:444556 CAPLUS
ACCESSION NUMBER:
DOCUMENT NUMBER:
                         135:33974
                         Polybenzoxazole resins and their precursors
TITLE:
                         with good thermal and electric
                         characteristics and low water absorption
                         Higashida, Yukihiro; Enoki, Hisashi
INVENTOR (S):
                         Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                         Jpn. Kokai Tokkyo Koho, 8 pp.
SOURCE:
                         CODEN: JKXXAF
DOCUMENT TYPE:
                         Patent
                         Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
```

PATENT NO. KIND DATE APPLICATION NO. DATE

JP 2001163976 A2 20010619 JP 1999-346182 19991206

PRIORITY APPLN. INFO.: JP 1999-346182 19991206

GI

I

AB The resins useful for interlayer dielec. films in semiconductor devices, solder resist films, liquid-crystalline orientation films, etc., are obtained by dehydrating and ring-closing the precursors having repeating unit I (n = 1-1000; R1-6 = F, fluoroalkyl; R7, R8 = H, monovalent organic group; i = 1-8; j = 0-7; i + j ≤8; Y = tetravalent aromatic group). Thus, a varnish of a precursor prepared from 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane and chloride of A(0-p-C6H4CO2H)2 (A = hexafluorocyclobutane residue) was applied on a plate and dried to give a precursor film, which was peeled from the plate and heated to give a polybenzoxazole film showing dielec. constant 2.3, good heat resistance, and water absorption 0.1%.

343943-93-1P 343944-00-3P 343944-07-0P
RL: IMF (Industrial manufacture); PRP (Properties); TEM
(Technical or engineered material use); PREP (Preparation); USES

(polybenzoxazole resins and their precursors with good thermal and elec. characteristics and low water absorption) 343943-93-1 CAPLUS

CM 1

тт

CRN 343943-89-5 CMF C18 H8 Cl2 F6 O4

CRN 2373-98-0 CMF C12 H12 N2 O2

CM 1

CRN 343943-96-4 CMF C20 H8 Cl2 F10 O4

CM 2

CRN 2373-98-0 CMF C12 H12 N2 O2

RN 343944-07-0 CAPLUS
CN Benzoyl chloride, 3,3'-[[1,2,2,3,4,5,5,6-octafluoro-3,6-bis(trifluoromethyl)-1,4-cyclohexanediyl]bis(oxy)]bis-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA INDEX NAME)

CM 1

CRN 343944-03-6 CMF C22 H8 Cl2 F14 O4

CM 2

CRN 2373-98-0 CMF C12 H12 N2 O2

IT 343943-95-3P 343944-02-5P 343944-09-2P
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(polybenzoxazole resins and their precursors with good thermal and elec. characteristics and low water absorption)

RN 343943-95-3 CAPLUS

CN

Poly[oxy(1,2,2,3,4,4-hexafluoro-1,3-cyclobutanediyl)oxy-1,4phenylenecarbonylimino(3,3'-dihydroxy[1,1'-biphenyl]-4,4'diyl)iminocarbonyl-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A

PAGE 1-B

RN 343944-02-5 CAPLUS

CN Poly[oxy(1,2,2,3,4,4,5,5,6,6-decafluoro-1,3-cyclohexanediyl)oxy-1,4-phenylenecarbonylimino(3,3'-dihydroxy[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A

PAGE 1-B

RN 343944-09-2 CAPLUS

CN Poly[oxy[1,2,2,3,4,5,5,6-octafluoro-3,6-bis(trifluoromethyl)-1,4-cyclohexanediyl]oxy-1,3-phenylenecarbonylimino(3,3'-dihydroxy[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A

PAGE 1-B

IC ICM C08G073-22 ICS H01B003-30

CC 37-3 (Plastics Manufacture and Processing) Section cross-reference(s): 38, 76

ST precursor polybenzoxazole dielec film heat resistance; bisaminohydroxyphenylhexafluoropropane

```
polybenzoxazole dielec film; arom polyamide precursor
     fluoro polybenzoxazole polyether
     Heat-resistant materials
IT
        (films; polybenzoxazole resins and their precursors with good
        thermal and elec. characteristics and low water absorption)
TT
     Films
        (heat-resistant; polybenzoxazole resins
        and their precursors with good thermal and elec.
        characteristics and low water absorption)
ΙT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamide-, aromatic, fluorine-containing; polybenzoxazole resins
        and their precursors with good thermal and elec.
        characteristics and low water absorption)
IΤ
     Dielectric films
        (polybenzoxazole resins and their precursors with good
        thermal and elec. characteristics and low water absorption)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-, fluorine-containing; polybenzoxazole
        resins and their precursors with good thermal and elec.
        characteristics and low water absorption)
     Fluoropolymers, preparation
ΙT
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-polyether-; polybenzoxazole resins
        and their precursors with good thermal and elec.
        characteristics and low water absorption)
     Polyamides, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-, aromatic, fluorine-containing; polybenzoxazole resins
        and their precursors with good thermal and elec.
        characteristics and low water absorption)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyether-, fluorine-containing; polybenzoxazole resins and
        their precursors with good thermal and elec. characteristics
        and low water absorption)
     343943-90-8P 343943-91-9P 343943-93-1P 343943-94-2P
IΤ
     343943-97-5P 343943-98-6P 343944-00-3P 343944-01-4P
     343944-04-7P 343944-05-8P 343944-07-0P 343944-08-1P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
      (Uses)
         (polybenzoxazole resins and their precursors with good
        thermal and elec. characteristics and low water absorption)
                   343943-92-0P 343943-95-3P 343943-96-4P
     343943-89-5P
TT
     343943-99-7P 343944-02-5P 343944-03-6P 343944-06-9P
```

343944-09-2P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(polybenzoxazole resins and their precursors with good thermal and elec. characteristics and low water absorption)

L30 ANSWER 34 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:

2001:129745 CAPLUS

DOCUMENT NUMBER:

134:179659

TITLE:

Heat-resistant resin compositions

with improved adhesion with substrates OR(S): Okuda, Yoshiharu; Tomikawa, Masao; Fujita, Yoji

INVENTOR(S): O

PATENT ASSIGNEE(S): Toray Industries, Inc., Japan

SOURCE:

Jpn. Kokai Tokkyo Koho, 16 pp.

DOCUMENT TYPE:

CODEN: JKXXAF
Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

JP 2001049119 A2 20010220 JP 1999-227814 19990811
PRIORITY APPLN. INFO:: JP 1999-227814 19990811

AB The compns. useful for interlayer insulating films and surface protective films for semiconductor devices contain heat-resistant resins or their precursors, solvents, and 1-10% (based on the resins) silicone diamines. Thus, stirring 4,4'-diaminodiphenyl ether 19.0, 1,3-bis(3-aminopropyl)tetramethyldisiloxane (I) 1.2, pyromellitic anhydride 10.9, and 3,3',4,4'-benzophenononetetracarboxylic acid dianhydride 15.0 g in NMP gave a polyamic acid, which was mixed with N,N-dimethylaminoethyl methacrylamide 26, ethylene glycol dimethacrylate 5, N-phenylglycine 2.5, 3,3'-carbonylbis(7-diethylaminocoumarin) 0.2, and I 0.9 g to give a photosensitive varnish. The varnish was applied on a silicone wafer and cured to give a film showing no peeling after heating.

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES

(heat-resistant resin compns. with good adhesion for semiconductor devices)

RN 326595-32-8 CAPLUS

Benzoic acid, 3,5-diamino-, 2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, 1,2-ethanediyl bis(2-methyl-2-propenoate) and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] (9CI) (CA INDEX NAME)

CM 1

CN

CRN 76067-81-7 CMF C13 H16 N2 O4

$$\begin{array}{c|c} \mathbf{0} & \mathbf{0} & \mathbf{CH_2} \\ \mathbf{H_2N} & \mathbf{C-O-CH_2-CH_2-O-C-C-Me} \\ \end{array}$$

CRN 2469-55-8 CMF C10 H28 N2 O Si2

CM 3

CRN 97-90-5 CMF C10 H14 O4

CM 4

CRN 89-32-7 CMF C10 H2 O6

IC ICM C08L079-08

```
ICS C08K005-544; G03F007-022; G03F007-037; H01L021-312
CC
    38-3 (Plastics Fabrication and Uses)
     Section cross-reference(s): 76
st
    polyimide precursor polyamic acid heat resistance;
    adhesion improver siloxane diamine polyimide; elec insulator
    heat resistance polyimide; photosensitive heat
    resistance resin; semiconductor heat resistance
     interlayer insulating film
TТ
    Heat-resistant materials
        (films; heat-resistant resin compns. with good
       adhesion for semiconductor devices)
    Adhesion promoters
IT
       Electric insulators
       Heat-resistant materials
     Semiconductor devices
        (heat-resistant resin compns. with good adhesion
        for semiconductor devices)
     Polybenzoxazoles
ΤТ
     Polyimides, uses
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (heat-resistant resin compns, with good adhesion
        for semiconductor devices)
TT
     Polvamic acids
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (heat-resistant resin compns. with good adhesion
        for semiconductor devices)
    Films
IT
        (heat-resistant; heat-resistant
        resin compns. with good adhesion for semiconductor devices)
IT
     Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyhydroxy-; heat-resistant resin compns. with
        good adhesion for semiconductor devices)
     98-59-9DP, p-Toluenesulfonyl chloride, reaction products with
IT
     1,3-bis(3-aminopropyl)tetramethyldisiloxane 110-16-7DP, Maleic acid,
     reaction products with 1,3-bis(3-aminopropyl)tetramethyldisiloxa
          2469-55-8DP, 1,3-Bis(3-aminopropyl)tetramethyldisiloxane, reaction
     products with toluenesulfonyl chloride
     RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP
     (Preparation); USES (Uses)
        (heat-resistant resin compns. with good adhesion
        for semiconductor devices)
     211873-94-8P 236095-20-8P 326595-30-6P
TΤ
     326595-32-8P 326595-33-9P 326595-34-0P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (heat-resistant resin compns. with good adhesion
        for semiconductor devices)
```

```
2469-55-8, 1,3-Bis(3-aminopropyl)tetramethyldisiloxane
ΙŤ
    RL: MOA (Modifier or additive use); USES (Uses)
       (heat-resistant resin compns. with good adhesion
       for semiconductor devices)
    83558-87-6, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane
ΙT
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (heat-resistant resin compns. with good adhesion
       for semiconductor devices)
L30 ANSWER 35 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                       2001:36912 CAPLUS
                       134:101643
DOCUMENT NUMBER:
                       Heat-resistant resin or precursor
TITLE:
                        compositions containing photopolymerable compounds for
                        electric insulators
                       Eguchi, Toshimasa; Murata, Mitsuru; Enoki, Hisashi
INVENTOR(S):
                      Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 7 pp.
SOURCE:
                        CODEN: JKXXAF
                       Patent
DOCUMENT TYPE:
                        Japanese
LANGUAGE:
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                KIND DATE
                                        APPLICATION NO. DATE
    PATENT NO.
    -----
                                        JP 1999-189108 19990702
                    A2 20010116
    JP 2001011181
                                      JP 1999-189108
PRIORITY APPLN. INFO.:
    The composition, useful as elec. insulators with good heat and
    elec. characteristics for electricity and electronic
    equipment and semiconductor devices, comprises (A) a photopolymerable
    functional group-containing compound, and (B) a heat-resistant
    resin or its precursor, wherein glass transition temperature of the resin is
    higher than thermal decomposition temperature of polymerized A. Thus, 10
parts polyimide
     (Tg 335°) prepared from 2,2-bis(4-(4,4'-
    aminophenoxy) phenyl) hexafluoropropane 5.18, 2,2'-bis(trifluoromethyl)-4,4'-
    diaminobiphenyl 9.60, pyromellitic dianhydride 2.94, and
    hexafluoroisopropylidene-2,2-bis(phthalic anhydride) 13.32 parts was mixed
    with poly(ethylene glycol) dimethacrylate 5.0 and benzophenone 0.02 parts
    was spin-coated onto a silicon wafer having a tantalum layer,
    UV-irradiated and heat cured to give a 0.8 \mu m-thick film showing
    dielec. const.2.4.
IT
    295358-48-4P
    RL: IMF (Industrial manufacture); POF (Polymer in formulation);
    TEM (Technical or engineered material use); PREP (Preparation);
     USES (Uses)
        (heat-resistant polyimide or
       polybenzoxazole compns. containing photopolymerable compds. for
        elec. insulators)
     295358-48-4 CAPLUS
RN
    1H, 3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with
CN
```

2,2'-bis(trifluoromethyl)[1,1'-biphenyl]-4,4'-diamine,
5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3isobenzofurandione] and 4,4'-[[2,2,2-trifluoro-1(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI)
(CA INDEX NAME)

CM 1

CRN 69563-88-8 CMF C27 H20 F6 N2 O2

CM 2

CRN 1107-00-2 CMF C19 H6 F6 O6

CM 3

CRN 341-58-2 CMF C14 H10 F6 N2

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CM 4
```

CRN 89-32-7 CMF C10 H2 O6

IC ICM C08G073-22

ICS C08G073-10; H01L023-29; H01L023-31

CC 37-6 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 76

ST heat resistance polymer elec insulator semiconductor; polyimide heat resistance elec insulator; polybenzoxazole heat resistance

elec insulator; polyethylene glycol dimethacrylate elec insulator

IT Polyamides, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (fluorine- and hydroxy-containing; heat-resistant polyimide or polybenzoxazole compns. containing photopolymerable compds. for elec. insulators)

## IT Polybenzoxazoles

Polyimides, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (fluorine-containing; heat-resistant polyimide or polybenzoxazole compns. containing photopolymerable compds. for elec. insulators)

IT Electric insulators

Heat-resistant materials

Semiconductor devices

(heat-resistant polyimide or

polybenzoxazole compns. containing photopolymerable compds. for elec. insulators)

IT Polyamic acids

Polybenzoxazoles

Polvimides, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(heat-resistant polyimide or

polybenzoxazole compns. containing photopolymerable compds. for elec. insulators)

```
IT
    Polymer blends
    RL: TEM (Technical or engineered material use); USES (Uses)
        (heat-resistant polyimide or
       polybenzoxazole compns. containing photopolymerable compds. for
        elec. insulators)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyamic acid-, fluorine-containing; heat-resistant
        polyimide or polybenzoxazole compns. containing photopolymerable
        compds. for elec. insulators)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyamic acid-polyether-; heat-resistant polyimide
        or polybenzoxazole compns. containing photopolymerable compds.
        for elec. insulators)
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyamide-, hydroxy-containing; heat-resistant
        polyimide or polybenzoxazole compns. containing photopolymerable
        compds. for elec. insulators)
TТ
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; heat-resistant
        polyimide or polybenzoxazole compns. containing photopolymerable
        compds. for elec. insulators).
IT
     Polyamic acids
     Polyimides, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyether-, fluorine-containing; heat-resistant
        polyimide or polybenzoxazole compns. containing photopolymerable
        compds. for elec. insulators)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyether-polyimide-; heat-resistant polyimide or
        polybenzoxazole compns. containing photopolymerable compds. for
        elec. insulators)
     Polyethers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
     (Technical or engineered material use); PREP (Preparation); USES (Uses)
        (polyimide-, fluorine-containing; heat-resistant
        polyimide or polybenzoxazole compns. containing photopolymerable
        compds. for elec. insulators)
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM
```

(Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyimide-; heat-resistant polyimide or

```
polybenzoxazole compns. containing photopolymerable compds. for
       elec. insulators)
    9043-05-4P, 4,4'-Diaminodiphenyl ether-pyromellitic dianhydride copolymer,
IT
    polyamic acid SRU 9051-34-7P, Polyethylene glycol dimethacrylate
    homopolymer 25036-53-7P, 4,4'-Diaminodiphenyl ether-pyromellitic
    dianhydride copolymer, polyimide sru 25038-81-7P, 4,4-Diaminodiphenyl
    ether-pyromellitic dianhydride copolymer 54002-11-8P 69067-16-9P
    112480-81-6P, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-4,4'-
    hexafluoroisopropylidene diphenyl-1,1'-dicarboxylic dichloride copolymer,
                         112513-26-5P 262352-93-2P 262352-94-3P
    polybenzoxazole SRU
    262352-95-4P 295358-48-4P
    RL: IMF (Industrial manufacture); POF (Polymer in formulation);
    TEM (Technical or engineered material use); PREP (Preparation);
    USES (Uses)
        (heat-resistant polyimide or
       polybenzoxazole compns. containing photopolymerable compds. for
       elec. insulators)
    1171-47-7 89803-71-4
IT
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (heat-resistant polyimide or
       polybenzoxazole compns. containing photopolymerable compds. for
        elec. insulators)
L30 ANSWER 36 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                      2000:765537 CAPLUS
DOCUMENT NUMBER:
                       133:336006
                       Heat-resistant branched polymer
TITLE:
                        compositions with low dielectric constant
                       Tomikawa, Masao; Fujiwara, Takenori
INVENTOR(S):
                      Torav Industries, Inc., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 14 pp.
SOURCE:
                        CODEN: JKXXAF
                        Patent
DOCUMENT TYPE:
LANGUAGE:
                        Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
                                       APPLICATION NO. DATE
                 KIND DATE
     PATENT NO.
     ______
                                         ______
                                        JP 2000-36641
                                                          20000215
     JP 2000302967 A2 20001031
                                     JP 1999-38472 A 19990217
PRIORITY APPLN. INFO.:
   The compns., useful for passivation films and interlayer insulation films,
     contain polymers (A) containing 5-35 mol% C3-30 tri- or tetravalent
     crosslinking groups, solid particles (B), and tertiary amines (C), where A
     have structures selected from NHC:OQ1(CO2Q4)qC:ONH[Q2NHC:OQ3(CO2Q5)rC:O]pN
     H, NHC:OQ5C:O[NHQ7(ZH)tNHC:OQ8C:O]sNH, C:ONHQ9NHC:O[Q10(CO2Q12)vC:ONHQ11NH
     C:O]u, and C:ONHQ13(ZH)xNH[C:OQ14C:ONHQ15(ZH)yNH]wC:O (Q1,3,10 =
     C\geq 2 organic group with valence 3 or 4; Q2,6,8,9,11,14=C\geq 2
     organic group with valence 2; Q4,5,12, = H, C1-10 organic group with valence 1;
     Q3,5,7 = C \ge 2 organic group with valence 3-6; Z = 0, S, NH; p, s, u, w
     = 1-100; q, r, t, v, x, y = 1, 2). Thus, a test piece manufactured
     from a polymer (prepared by polymerization of 3,4,4'-triaminodiphenyl
```

ΙT

CN

ether, pyromellitic anhydride, and 2,2'-dimethyl-4,4'-diaminobiphenyl and addition of aniline and 3-aminopropyltrimethoxysilane), FEP (PTFE-polypropylene sol), and lutidine showed dielec. constant 2.21, heat resistance 450°, and good scratch resistance and adhesion to a Si wafer.

261620-17-1DP, 2,2'-Dimethyl-4,4'-diaminobiphenyl-pyromellitic anhydride-3,4,4'-triaminodiphenyl ether copolymer, reaction products with aniline and aminopropyltrimethoxysilane 304011-89-0DP, reaction products with phthalic anhydride and nadic anhydride

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(heat- and scratch-resistant branched polymer compns. with low dielec. constant)

RN 261620-17-1 CAPLUS

1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 4-(4-aminophenoxy)-1,2-benzenediamine and 2,2'-dimethyl[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX NAME)

CM 1

CRN 6264-66-0 CMF C12 H13 N3 O

CM 2

CRN 89-32-7 CMF C10 H2 O6

CM 3

CRN 84-67-3

CMF C14 H16 N2

RN 304011-89-0 CAPLUS

CN 1,3,5-Benzenetricarbonyl trichloride, polymer with 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, 2,2'-bis(trifluoromethyl)[1,1'-biphenyl]-4,4'-diamine and 2,2'-dimethyl[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX

NAME)

CRN 4422-95-1 CMF C9 H3 Cl3 O3

CM 2

CRN 341-58-2 CMF C14 H10 F6 N2

CM 3

CRN 89-32-7 CMF C10 H2 O6

CM 4

CRN 84-67-3 CMF C14 H16 N2

IC ICM C08L077-00

ICS C08K003-00; C08K005-17; H01L021-312; C08G069-00

CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 76

ST heat resistance branched polymer elec

insulator; step growth polymn polymide aminopropyltrimethoxysilane

termination; scratch resistance dielec film semiconductor silica

IT Polybenzoxazoles

Polybenzoxazoles

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(fluorine-containing, polybenzothiazole-polyamic acid-polyether; heat- and scratch-resistant branched polymer compns. with low

dielec. constant)

IT Polyamic acids

Polyamic acids
Polyimides, preparation

Polyimides, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP

(Properties); TEM (Technical or engineered material use); PREP

(Preparation); USES (Uses)

(fluorine-containing; heat- and scratch-resistant branched polymer compns. with low dielec. constant)

```
Abrasion-resistant materials
IT
       Electric insulators
    Electronic packaging materials
       Heat-resistant materials
     Semiconductor devices
        (heat- and scratch-resistant branched polymer compns. with low
        dielec. constant)
    Polybenzoxazoles
IT
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (heat- and scratch-resistant branched polymer compns. with low
        dielec. constant)
ΤТ
    Fluoropolymers, uses
    RL: MOA (Modifier or additive use); USES (Uses)
        (heat- and scratch-resistant branched polymer compns. with low
        dielec. constant)
IT
    Adhesives
        (heat-resistant; heat- and scratch-resistant
        branched polymer compns. with low dielec. constant)
IT
     Polyketones
     Polyketones
     Polyketones
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamic acid-, fluorine-containing; heat- and scratch-resistant branched
        polymer compns. with low dielec. constant)
TΨ
    Polyamides, preparation
       Polyamides, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamic acid-, fluoropolymer-; heat- and scratch-resistant branched
        polymer compns. with low dielec. constant)
ΤТ
     Fluoropolymers, preparation
     Fluoropolymers, preparation
     Polyethers, preparation
     Polyethers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamic acid-; heat- and scratch-resistant branched polymer compns.
        with low dielec. constant)
     Fluoropolymers, preparation
TТ
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamic acid-polyketone-; heat- and scratch-resistant branched
        polymer compns. with low dielec. constant)
     Polybenzoxazoles
TT
       Polybenzoxazoles
```

```
Polybenzoxazoles
     Polyimides, preparation
     Polyimides, preparation
     Polyimides, preparation
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamide-, fluorine-containing; heat- and scratch-resistant branched
        polymer compns. with low dielec. constant)
TΨ
    Polyamic acids
     Polyamic acids
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamide-, fluoropolymer-; heat- and scratch-resistant branched
        polymer compns. with low dielec. constant)
IT
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamide-polybenzoxazole-; heat- and scratch-resistant
        branched polymer compns. with low dielec. constant)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyamide-polyimide-; heat- and scratch-resistant branched polymer
        compns. with low dielec. constant)
IT
     Polyamides, preparation
       Polyamides, preparation
       Polyamides, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polybenzoxazole-, fluorine-containing; heat- and
        scratch-resistant branched polymer compns. with low dielec.
        constant)
IΤ
     Fluoropolymers, preparation
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polybenzoxazole-, polybenzothiazole-polyamic
        acid-polyether; heat- and scratch-resistant branched polymer compns.
        with low dielec. constant)
тт
     Polyimides, preparation
     Polyimides, preparation
     Polyimides, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyether-, fluorine-containing, polybenzothiazole-
```

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polybenzoxazole-; heat- and scratch-resistant branched polymer
        compns. with low dielec. constant)
IT
     Polvamic acids
     Polyamic acids
     Polyimides, preparation
     Polyimides, preparation
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyether-; heat- and scratch-resistant branched polymer compns. with
        low dielec. constant).
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyether-polyimide-, polybenzothiazole-
       polybenzoxazole-; heat- and scratch-resistant branched polymer
       compns. with low dielec. constant)
IT
    Polyethers, preparation
     Polyethers, preparation
     Polyethers, preparation
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyimide-, fluorine-containing, polybenzothiazole-
       polybenzoxazole-; heat- and scratch-resistant branched polymer
       compns. with low dielec. constant)
IT
    Polyamides, preparation
       Polyamides, preparation
       Polyamides, preparation
     Polyketones
     Polyketones
     Polyketones
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyimide-, fluorine-containing; heat- and scratch-resistant branched
       polymer compns. with low dielec. constant)
IT
    Fluoropolymers, preparation
    Fluoropolymers, preparation
     Polyethers, preparation
     Polyethers, preparation
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyimide-; heat- and scratch-resistant branched polymer compns. with
        low dielec. constant)
IT
    Fluoropolymers, preparation
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation): USES (Uses)
        (polyimide-polyketone-; heat- and scratch-resistant branched polymer
```

```
compns. with low dielec. constant)
ΙT
    Polyamic acids
    Polyamic acids
    Polyamic acids
    Polyimides, preparation
    Polyimides, preparation
    Polyimides, preparation
    RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
     (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (polyketone-, fluorine-containing; heat- and scratch-resistant branched
       polymer compns. with low dielec. constant)
IT
    Amines, uses
    RL: MOA (Modifier or additive use); USES (Uses)
        (tertiary; heat- and scratch-resistant branched polymer compns. with
       low dielec. constant)
TT
    7631-86-9, Silica, uses
    RL: MOA (Modifier or additive use); USES (Uses)
        (Oscal NP 45; heat- and scratch-resistant branched polymer compns. with
       low dielec. constant)
    1314-23-4, Zirconia, uses
IT
    RL: MOA (Modifier or additive use); USES (Uses)
        (Torayceram; heat- and scratch-resistant branched polymer compns. with
        low dielec. constant)
    62-53-3DP, Aniline, reaction products with polyimides
TT
    85-44-9DP, Phthalic anhydride, reaction products with polyimides
     98-88-4DP, Benzoyl chloride, reaction products with polyimides
    108-31-6DP, Maleic anhydride, reaction products with polyimides
    129-64-6DP, Nadic acid anhydride, reaction products with
    polyimides
                  919-30-2DP, 3-Aminopropyltriethoxysilane; reaction
    products with polyimides 13822-56-5DP, 3-
    Aminopropyltrimethoxysilane, reaction products with polyimides
    14235-81-5DP, 4-Ethynylaniline, reaction products with
                158828-97-8DP, reaction products with polyimides
    polyimides
    261620-17-1DP, 2,2'-Dimethyl-4,4'-diaminobiphenyl-pyromellitic
     anhydride-3,4,4'-triaminodiphenyl ether copolymer, reaction
    products with aniline and aminopropyltrimethoxysilane
    261620-22-8DP, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-
    biphenyltetracarboxylic dianhydride-2,2'-bis(trifluoromethyl)-4,4'-
    diaminodiphenyl-pyromellitic anhydride-tris(4-aminophenyl)methane
    copolymer, reaction products with aminopropyltriethoxysilane and
             304011-87-8DP, reaction products with maleic anhydride
    and phthalic anhydride 304011-88-9DP, reaction products with
     maleic anhydride, phthalic anhydride, and trimethoxysilylphthalic
     anhydride 304011-89-0DP, reaction products with
    phthalic anhydride and nadic anhydride 304011-92-5DP, reaction
    products with ethynylaniline, aminopropyltriethoxysilane, and
              304011-94-7DP, reaction products with benzoyl
     aniline
     chloride, maleic anhydride, and trimethoxysilylphthalic anhydride
     304011-97-0DP, reaction products with benzoyl chloride,
     aminopropyltriethoxysilane, ethynylaniline, and aniline
                                                              304011-99-2P
     RL: IMF (Industrial manufacture); POF (Polymer in formulation);
```

```
PRP (Properties); TEM (Technical or engineered material use); PREP
     (Preparation); USES (Uses)
        (heat- and scratch-resistant branched polymer compns. with low
       dielec constant)
    5981-09-9P. Tris(4-aminophenyl)amine
IT
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (heat- and scratch-resistant branched polymer compns. with low
       dielec. constant)
    100-37-8. Diethylaminoethanol 105-16-8, Diethylaminoethyl methacrylate
IΤ
    110-86-1, Pyridine, uses 121-44-8, uses 1306-38-3, Ceria, uses
    1421-89-2, Dimethylaminoethyl acetate 2867-47-2 9002-84-0, Polyflon
    TFE 25067-11-2, FEP 27175-64-0, Lutidine 99685-96-8,
    [5,6]Fullerene-C60-Ih 131159-39-2, Fullerene
    RL: MOA (Modifier or additive use); USES (Uses)
        (heat- and scratch-resistant branched polymer compns. with low
       dielec. constant)
    603-34-9 7697-37-2, Nitric acid, reactions
TΤ
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (heat- and scratch-resistant branched polymer compns. with low
       dielec. constant)
L30 ANSWER 37 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                      2000:674186 CAPLUS
DOCUMENT NUMBER:
                       133:253323
                       Heat-resistant resin precursor
TITLE:
                       compositions and preparation of heat
                        -resistant resins therefrom
                      Equchi, Toshimasa; Murata, Mitsuru
INVENTOR(S):
INVENTOR(S): Eguchi, Toshimasa; Murata, Mitsuru PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan
                       Jpn. Kokai Tokkyo Koho, 6 pp.
SOURCE:
                       CODEN: JKXXAF
DOCUMENT TYPE:
                       Patent
LANGUAGE:
                       Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
    PATENT NO. KIND DATE APPLICATION NO. DATE
                                        -----
     -----
                                       JP 1999-69882 19990316
    JP 2000265057 A2 20000926
                                     JP 1999-69882
                                                         19990316
PRIORITY APPLN. INFO.:
   Title compns. comprise (A) heat-resistant resin
    precursors which form heat-resistant resins by thermal
    reaction, preferably polyimides or polybenzoxazoles, and (B)
     solvents having b.p. higher than the temperature where the precursors react to
     form heat-resistant resins and lower than the glass
     transition temperature of the heat-resistant resins. Thus,
     10.0 g polyamic acid (temperature to form polyimide 220°, Tg of polyimide
     345°) obtained from 2,2-bis(4-(4,4'-aminophenoxy)phenyl)hexafluorop
     ropane 5.18, 2,2'-bis(trifluoromethyl)-4,4'-diaminobiphenyl 9.60,
     pyromellitic dianhydride 6.54, and hexafluoroisopropylidene-2,2-
     bis (phthalic anhydride) 4.44 g was dissolved in 40.0 g NMP and 6.0 g
```

2-phenoxyethanol (b.p. 245°) was added to give a heatresistant resin precursor. The precursor was spin coated on a silicon wafer with a Cr layer and heat cured to give a 0.8 μm-thick heat-resistant resin film showing dielec. constant 2.4.

295358-48-4P 295358-49-5P IT

RL: IMF (Industrial manufacture); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses) (preparation of polyimide or polybenzoxazole heat-resistant resins and their precursor compns.)

295358-48-4 CAPLUS 1H, 3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 2,2'-bis(trifluoromethyl)[1,1'-biphenyl]-4,4'-diamine, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3isobenzofurandione] and 4,4'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM

RN

CN

CRN 69563-88-8 CMF C27 H20 F6 N2 O2

CM 2

CRN 1107-00-2 CMF C19 H6 F6 O6

CM 3 CRN 341-58-2 CMF C14 H10 F6 N2

CM 4

CRN 89-32-7 CMF C10 H2 O6

RN 295358-49-5 CAPLUS
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with
3,3'-dimethyl[1,1'-biphenyl]-4,4'-diamine, 4,4'-oxybis[benzenamine],
5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3-isobenzofurandione] and 4,4'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI)
(CA INDEX NAME)

CM 1

CRN 69563-88-8 CMF C27 H20 F6 N2 O2

CRN 1107-00-2 CMF C19 H6 F6 O6

CM 3

CRN 119-93-7 CMF C14 H16 N2

$$_{\rm H_2N} \underset{\rm Me}{ \begin{subarray}{c} \end{subarray}} {\rm NH_2}$$

CM 4

CRN 101-80-4 CMF C12 H12 N2 O

CM 5

CRN 89-32-7 CMF C10 H2 O6

```
IC
    ICM C08L079-08
     ICS C08G073-10; C08G073-22; C08L079-04; H01L021-312
     37-6 (Plastics Manufacture and Processing)
CC
    Section cross-reference(s): 76
    polyimide heat resistant resin precursor;
ST
    polybenzoxazole heat resistant resin precursor
    Heat-resistant materials
TT
        (dielec.; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
IT
     Polybenzoxazoles
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (fluorine-containing; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
IT
     Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (fluorine-containing; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
TΨ
     Electric insulators
        (heat-resistant; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
     Polyethers, preparation
ΙT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamic acid-, fluorine-containing; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyamic acid-polyether-; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
     Fluoropolymers, preparation
IT
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
```

(polyamide-; preparation of polyimide or polybenzoxazole

(Reactant or reagent)

```
heat-resistant resins and their precursor compns.)
IT
    Fluoropolymers, preparation
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polybenzoxazole-; preparation of polyimide or
       polybenzoxazole heat-resistant resins and
        their precursor compns.)
    Polyimides, preparation
IT
     Polyimides, preparation
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyether-, fluorine-containing; preparation of polyimide or
       polybenzoxazole heat-resistant resins and
        their precursor compns.)
     Polyamic acids
IT
     Polyamic acids
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (polyether-, fluorine-containing; preparation of polyimide or
       polybenzoxazole heat-resistant resins and
        their precursor compns.)
IT
     Fluoropolymers, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyether-polyimide-; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
     Polyethers, preparation
IT
     Polyethers, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (polyimide-, fluorine-containing; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
IT
     Polybenzoxazoles
     Polyimides, preparation
     RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (preparation of polyimide or polybenzoxazole
        heat-resistant resins and their precursor compns.)
TT
     Polyamic acids
       Polyamides, preparation
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (preparation of polyimide or polybenzoxazole
        heat-resistant resins and their precursor compns.)
IT
     1171-47-7
               7719-09-7, Thionyl chloride
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (in monomer preparation; preparation of polyimide or
        polybenzoxazole heat-resistant resins and
        their precursor compns.)
     1102-92-7P
TΤ
```

```
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (monomer; preparation of polyimide or polybenzoxazole
       heat-resistant resins and their precursor compns.)
    122-99-6. 2-Phenoxyethanol 143-22-6, Triethylene glycol monobutyl ether
TΨ
    143-24-8, Tetraethylene glycol dimethyl ether
    RL: NUU (Other use, unclassified); USES (Uses)
       (precursor composition solvent; preparation of polyimide or
       polybenzoxazole heat-resistant resins and
       their precursor compns.)
    112513-26-5P 295358-48-4P 295358-49-5P
IT
    RL: IMF (Industrial manufacture); PRP (Properties); RCT
     (Reactant); TEM (Technical or engineered material use); PREP
     (Preparation); RACT (Reactant or reagent); USES (Uses)
        (preparation of polyimide or polybenzoxazole
       heat-resistant resins and their precursor compns.)
    112480-81-6P
TT
    RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
    engineered material use); PREP (Preparation); USES (Uses)
        (preparation of polyimide or polybenzoxazole
        heat-resistant resins and their precursor compns.)
TT
    113716-09-9P
    RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (preparation of polyimide or polybenzoxazole
       heat-resistant resins and their precursor compns.)
L30 ANSWER 38 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                       2000:452514 CAPLUS
DOCUMENT NUMBER:
                       133:59253
                       Naphthalene-based polybenzoxazole precursors
TITLE:
                        and heat-resistant
                        electrically insulating
                        polybenzoxazoles therefrom
                        Eguchi, Toshimasa; Higashida, Yukihiro; Yamaji,
INVENTOR(S):
                        Takashi
                        Sumitomo Bakelite Co., Ltd., Japan
PATENT ASSIGNEE(S):
                        Jpn. Kokai Tokkyo Koho, 8 pp.
SOURCE:
                        CODEN: JKXXAF
                        Patent
DOCUMENT TYPE:
LANGUAGE:
                        Japanese
FAMILY ACC. NUM. COUNT: 4
PATENT INFORMATION:
                                        APPLICATION NO. DATE
    PATENT NO.
                 KIND DATE
                     ----
                                         _____
     -----
     JP 2000186145 A2
                           20000704
                                         JP 1998-365685 19981222
                                        US 1999-465004 19991216
    US 6297351
                     B1 20011002
                                      JP 1998-359561 A 19981217
PRIORITY APPLN. INFO.:
                                       JP 1998-365684 A 19981222
                                       JP 1998-365685 A 19981222
                                       JP 1998-365686 A 19981222
```

GI

- \* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY AVAILABLE VIA OFFLINE PRINT \*
- AB The precursors, useful for semiconductor devices, have repeating units I, II, III, IV, or V (R1 = F, fluoroalkyl; R2-4 = H, F, fluoroalkyl; R5.6 = H, organic group; X = multifunctional organic group; n = 1-1000). Thus, a varnish containing a reaction product of 5.24 g 2,7-diamino-3,6-dihydroxytetrafluoronaphthalene and 8.58 g 4,4'-(hexafluoroisopropylidene)dibenzoyl chloride was molded into a film and heated to give a test piece showing dielec. constant 2.5 and glass-transition temperature 419°.
- IT 276873-48-4P 276873-51-9P 276873-53-1P

  RL: IMF (Industrial manufacture); PRP (Properties); TEM

  (Technical or engineered material use); PREP (Preparation); USES

  (Uses)

(heat-resistant elec. insulating polybenzoxazoles prepared from naphthalene ring-based fluorinated precursors for semiconductor devices)

CM 1

CRN 276873-47-3 CMF C10 H6 F4 N2 O2

CM 2

CRN 1102-92-7 CMF C17 H8 Cl2 F6 O2

RN 276873-51-9 CAPLUS

CN 1,3-Benzenedicarbonyl dichloride, 2,4,5,6-tetrafluoro-, polymer with
3,7-diamino-1,5-bis(trifluoromethyl)-2,6-naphthalenediol (9CI) (CA INDEX
NAME)

CM 1

CRN 276873-50-8 CMF C12 H8 F6 N2 O2

$$\begin{array}{c} \text{CF}_3 \\ \text{H2N} \\ \end{array} \begin{array}{c} \text{NH}_2 \\ \text{CF}_3 \end{array}$$

CM 2

CRN 110649-97-3 CMF C8 Cl2 F4 O2

RN 276873-53-1 CAPLUS

CN Benzoyl chloride, 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 3,7-diamino-1,5-bis(trifluoromethyl)-2,6-naphthalenediol (9CI) (CA INDEX NAME)

CRN 276873-50-8 CMF C12 H8 F6 N2 O2

CM :

CRN 1102-92-7 CMF C17 H8 Cl2 F6 O2

IC ICM C08G073-22

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 76

ST elec insulator aminohydroxyfluoronaphthalene carboxyphenylfluoropropane polybenzoxazole semiconductor; heat resistance fluorinated polynaphthoxazole precursor

IT Electric insulators

Heat-resistant materials

(heat-resistant elec. insulating

polybenzoxazoles prepared from naphthalene ring-based fluorinated precursors for semiconductor devices)

IT Fluoropolymers, preparation

Polybenzoxazoles

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(heat-resistant elec. insulating

polybenzoxazoles prepared from naphthalene ring-based fluorinated precursors for semiconductor devices)

IT Polyamides, preparation

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or

```
engineered material use); PREP (Preparation); USES (Uses)
        (precursors; heat-resistant elec.
        insulating polybenzoxazoles prepared from naphthalene
        ring-based fluorinated precursors for semiconductor devices)
IΤ
     1102-92-7P, 4,4'-(Hexafluoroisopropylidene)dibenzoyl chloride
     1551-39-9P, Tetrafluoroisophthalic acid 110649-97-3P
     RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
     (Reactant or reagent)
        (for precursor preparation; heat-resistant
        elec. insulating polybenzoxazoles prepared
        from naphthalene ring-based fluorinated precursors for semiconductor
        devices)
IΤ
     1171-47-7, 4,4'- (Hexafluoroisopropylidene) dibenzoic acid 2377-81-3,
     1,3-Dicyanotetrafluorobenzene 7719-09-7, Thionyl chloride
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (for precursor preparation; heat-resistant
        elec. insulating polybenzoxazoles prepared
        from naphthalene ring-based fluorinated precursors for semiconductor
        devices)
     91-20-3DP, Naphthalene, tetra(trifluoromethyl)diaminodihydroxy derivs.,
     polymers with diaminodihydroxybiphenyl and (hexafluoroisopropylidene)diben
     zoyl chloride copolymer, preparation 1102-92-7DP,
     4,4'-(Hexafluoroisopropylidene)dibenzoyl chloride, polymers with
     diaminodihydroxybiphenyl and tetra(trifluoromethyl)diaminodihydroxynaphtha
            4194-40-5DP, 3,3'-Diamino-4,4'-dihydroxybiphenyl, polymers with
     tetra(trifluoromethyl)diaminodihydroxynaphthalene and
     (hexafluoroisopropylidene)dibenzoyl chloride 276873-48-4P
     276873-49-5P 276873-51-9P 276873-52-0P 276873-53-1P
     276873-54-2P
     RL: IMF (Industrial manufacture); PRP (Properties); TEM
     (Technical or engineered material use); PREP (Preparation); USES
     (Uses)
        (heat-resistant elec. insulating
        polybenzoxazoles prepared from naphthalene ring-based
        fluorinated precursors for semiconductor devices)
L30 ANSWER 39 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1994:55331 CAPLUS
DOCUMENT NUMBER:
                       120:55331
TITLE:
                       Heat-resistant phenylquinoxaline
                        copolymers useful as dielectrics
INVENTOR(S):
                       Ahne, Hellmut; Zapf, Lothar
PATENT ASSIGNEE(S): Siemens A.-G., Germany SOURCE: Eur. Pat. Appl., 12 pp.
                        CODEN: EPXXDW
DOCUMENT TYPE:
                       Patent
LANGUAGE:
                        German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
     PATENT NO.
                 KIND DATE
                                         APPLICATION NO. DATE
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EP 544165 A1 19930602 EP 1992-119492 EP 544165 B1 19960605 R: DE, FR, GB, IT, NL, SE 19931109 JP 1992-335570 19921120 JP 05295114 A2 US 1992-982191 19921125 US 5278277 Α 19940111 PRIORITY APPLN. INFO.: DE 1991-4138862 19911126 Phenylquinoxaline polymers of specified structure, with good elec . and thermal properties and processable in nontoxic solvents, are prepared Condensing 1 mol 4,4''-oxydibenzil with 1 mol 3,4-diaminobenzoic acid gave 2,2'-(oxydi-1,4-phenylene)bis(3-phenyl-6quinoxalinecarboxylic acid) which was converted to the diacid chloride (I) with SOCl2. Polymerizing I with 3,3'-dihydroxybenzidine gave a polyamide with dielec. constant (1 kHz, 25°) 3.03, tan  $\delta$  0.0013, and elec. resistance 1.3 + 1018  $\Omega$ -cm, which could be cyclized at .apprx.400° to form benzoxazole groups. IT 152289-94-6P

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture of heat-resistant, with good dielec. properties)

RN 152289-94-6 CAPLUS

CN 6-Quinoxalinecarbonyl chloride, 2,2'-(oxydi-4,1-phenylene)bis[3-phenyl-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA INDEX NAME)

CM 1

CRN 152289-93-5 CMF C42 H24 Cl2 N4 O3

CM

CRN 2373-98-0 CMF C12 H12 N2 O2

```
ICM C08G073-06
TC
     ICS C08G073-10; H01B003-30
     35-5 (Chemistry of Synthetic High Polymers)
CC
     Section cross-reference(s): 76
ST
     phenylquinoxaline polymer heat resistance; quinoxaline
     polymer heat resistance; dielec
     phenylquinoxaline polymer; oxydibenzil reaction diaminobenzoic acid;
     dihydroxybenzidine copolymer; benzoxazole deriv polymer
IT
     Polyguinoxalines
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (manufacture of heat-resistant, with good
        dielec. properties)
     Heat-resistant materials
IT
        (phenylquinoxaline polymers, manufacture of)
     Electric insulators and Dielectrics
TΤ
        (phenylquinoxaline polymers, manufacture of heat-
        resistant)
IT
     Polyquinoxalines
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polyamide-, manufacture of heat-resistant,
        with good dielec. properties)
TТ
     Polyquinoxalines
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polybenzoxazole-, manufacture of heat-
        resistant, with good dielec. properties)
IT
     Polyamides, preparation
       Polybenzoxazoles
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (polyquinoxaline-, manufacture of heat-resistant
        , with good dielec. properties)
     19609-85-9DP, 5H-Isoindolo[2,1-a]benzimidazole, derivs., polymers
IT
     147212-00-8P 152289-94-6P
                               152326-28-8P 152326-29-9P
     RL: IMF (Industrial manufacture); PREP (Preparation)
        (manufacture of heat-resistant, with good
        dielec. properties)
тт
     147233-57-6P
     RL: PREP (Preparation)
        (preparation of)
TT
     21454-19-3
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with diaminobenzoic acid)
     619-05-6, 3,4-Diaminobenzoic acid
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with oxydibenzil)
L30 ANSWER 40 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                        1990:572928 CAPLUS
DOCUMENT NUMBER:
                         113:172928
                         Copolymers containing polybenzoxazole,
TITLE:
                         polybenzothiazole and polybenzimidazole
                         moieties
INVENTOR (S):
                        Harris, William J.; Hwang, Wen Fang
```

PATENT ASSIGNEE(S):

Dow Chemical Co., USA

SOURCE:

PCT Int. Appl., 212 pp. CODEN: PIXXD2

DOCUMENT TYPE:

Patent

LANGUAGE:

English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

APPLICATION NO. DATE PATENT NO. KIND DATE --------------A1 19900419 WO 9003995 WO 1989-US4464 19891006 W: JP, KR RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE US 5089568 A 19920218 US 1988-256338 19881011 US 5030706 A 19910709 US 1989-327925 19890323 US 5110894 A 19920505 US 1989-378360 19890707 A 19920929 A1 19901017 US 1989-407973 19890915 US 5151489 EP 392008 EP 1989-912725 19891006 R: BE, CH, DE, FR, GB, IT, LI, NL T2 19910418 JP 1989-511754 19891006 JP 03501751 US 1988-256338 19881011 PRIORITY APPLN. INFO.: US 1989-327925 19890323 US 1989-378360 19890707 US 1989-407973 19890915 19891006 WO 1989-US4464

A block copolymer comprises a (1) polybenzazole block having AB ≥10-mer units; and (2) a thermoplastic block linked to the polybenzazole block containing a polyamide, polyimide, polyquinoxaline, polyquinoline, poly(aromatic ketone), poly(aromatic sulfone) or aromatic ether (co)polymer of ≥1 of those polymers, with 2 comprising ≥2-mer units or having an average formula weight .apprx.800. A dope from 4,6-diaminoresorcinol-2HCl 75 g and terephthaloyl chloride (I) 69.3 g was prepared in polyphosphoric acid 314 g containing 76 weight% P2O5 under N. Heating at 95°, adding 179 g P2O5, and continuing the reaction with stirring for 8 h at 95° and 16 h at 150° and 24 h at 190° gave dope which was stored under N. A polyamide was prepared from I 14.10 in 400 mL N-methylpyrrollidinone (II) and bis(4-aminophenyl) ether 13.49 and CaCl2 4.29 g, followed by washing with 100 mL of II. The polyamide was precipitated and collected (20.49 g). polyamide 3 g and 15.05 g of the dope were added with stirring to 84 g 10:1 MeSO3H-P2O5 mixture Heating 16 h at 70° and 48 h at 90° gave the cis-polybenzoxazole-polyamide block copolymer with inherent viscosity 4.07 dL/g.

IT 129844-92-4P

RL: PREP (Preparation)

(preparation of, ring closure in)

RN 129844-92-4 CAPLUS

1,4-Benzenedicarbonyl dichloride, polymer with 4,6-diamino-1,3-benzenediol dihydrochloride, 1,4-diphenoxybenzene and 4,4'-[(1,2,3,3,4,4-hexafluoro-1,2-cyclobutanediyl)bis(oxy)]bis[benzoyl chloride], block (9CI) (CA INDEX NAME)

Page 272 Duc10609460

CM 1

CRN 129844-91-3 CMF C18 H8 Cl2 F6 O4

CM 2

CRN 16523-31-2 CMF C6 H8 N2 O2 . 2 Cl H

●2 HCl

CM 3

CRN 3061-36-7 CMF C18 H14 O2

CM 4

CRN 100-20-9 CMF C8 H4 Cl2 O2

IC ICM C08G075-32

ICS C08G073-22; C08G073-18

CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 40

ST polybenzoxazole polyamide block; ring closure block polymn

IT Coating materials

(polybenzazole block copolymers)

IT Synthetic fibers

RL: PREP (Preparation)

(polybenzoxazole block copolymers, preparation of)

IT Polymerization

(cyclo-, in preparation of block polybenzazoles)

IT Polyketones

RL: PREP (Preparation)

(polyamide-polybenzoxazole-, preparation of, ring

closure in)

IT Polyimides, preparation

RL: PREP (Preparation)

(polyamide-polybenzoxazole-, block, preparation and

characterization of)

IT Polyketones

RL: PREP (Preparation)

(polyamide-polybenzoxazole-, block, fiber, preparation

and characterization of)

IT Synthetic fibers, polymeric

RL: PREP (Preparation)
(polyamide-polybenzoxazole-polyketones, block, prepn

. and characterization of)

IT Synthetic fibers, polymeric

RL: PREP (Preparation)

(polyamide-polyoxazoles, preparation of, characterization in)

IT Polyamides, preparation

RL: PREP (Preparation)

(polybenzoxazole-, preparation of, ring closure in)

IT Polyamides, preparation

RL: PREP (Preparation)

(polybenzoxazole-polyimide-, block, preparation and

```
characterization of)
ΙT
     Polyamides, preparation
     RL: PREP (Preparation)
        (polybenzoxazole-polyketone-, preparation of, ring
        closure in)
IT
     Polyamide fibers, preparation
     RL: PREP (Preparation)
        (polybenzoxazole-polyketone-, block, preparation and
        characterization of)
     Synthetic fibers, polymeric
IT
     RL: PREP (Preparation)
        (polybenzoxazoles, block, preparation of)
ΙT
     Polyamide fibers, preparation
     RL: PREP (Preparation)
        (polyoxazole-, preparation of, characterization in)
ΙT
     Electric circuits
        (printed, boards, laminates for, polybenzazole block copolymers as)
IT
     24938-60-1P 25035-33-0P 25668-34-2P 26101-19-9P 26809-79-0P
     26854-93-3P 28576-59-2P 53302-20-8P 60871-72-9P 66536-08-1P
     109779-83-1P 129807-61-0P 129844-89-9P 129844-99-1P
     RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and block polymerization of)
TΨ
     3232-24-4P
                130043-89-9P
     RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and chlorination of)
ΙT
     130043-93-5P
     RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and cyclization of)
ΙT
     65012-57-9P 99113-99-2P 129844-91-3P
     RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and polymerization of)
IT
     3769-82-2P
                 50434-36-1P, 4-Nitrophenylacetyl chloride
     RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and reaction of)
IΤ
    22711-24-6P, 4-Nitrobenzil
    RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and reaction of, with hydroquinone and phenoxyphenol)
IT
    123-31-9P, 1,4-Benzenediol, preparation
    RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and reaction of, with nitrobenzil)
IT
    130043-92-4P
    RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and reaction of, with zinc)
TТ
    130043-87-7P
    RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
        (preparation and sulfonation of)
    121-63-1P 107873-45-0P 129807-62-1DP, cis derivs., polyamide-, block
ΙT
    129923-04-2P
                  130043-88-8P 130043-90-2P
    RL: PREP (Preparation)
        (preparation of)
ΙT
    91-19-0DP, Quinoxaline, derivs., polymers 91-22-5DP, Quinoline, derivs.,
    polymers 69794-31-6P 77756-61-7P 129807-54-1P 129807-55-2P
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129807-56-3P 129807-57-4P 129807-64-3P
                                                  129807-65-4P
                                                                129807-67-6P
     129807-68-7P 129844-87-7P 129844-88-8P 129844-90-2P
     129844-92-4P 129844-93-5P 129844-95-7P 129844-96-8P
     129844-98-0P 129862-89-1P 129915-25-9P
     RL: PREP (Preparation)
        (preparation of, ring closure in)
IT
     7719-09-7, Thionvl chloride
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with (phenoxyphenoxy)benzoic acid)
IT
     99-76-3
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with 1,2-dibromotetrafluoroethane)
IT
     7790-94-5, Chlorosulfuric acid
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with Me (phenoxyphenoxy)benzoate)
IT
     124-73-2, 1,2-Dibromotetrafluoroethane
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with Me hydroxybenzoate)
     831-82-3, 4-Phenoxyphenol
IТ
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with Me nitrobenzoate)
IT
               3061-36-7, 1,4-Diphenoxybenzene
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with chlorosulfonic acid)
TΨ
     7790-94-5, Chlorosulfuric acid
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with diphenoxybenzene)
ΤТ
     831-82-3, 4,-Phenoxyphenol
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with nitrobenzil)
     1204-28-0, Trimellitic anhydride acid chloride
IT
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with phenoxyaniline)
IT
     619-50-1, Methyl-4-nitrobenzoate
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with phenoxyphenol)
IT
     104-03-0, 4-Nitrophenylacetic acid
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with thionyl chloride)
IT
     139-59-3, 4-Phenoxyaniline
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction of, with trimellitic anhydride)
L30 ANSWER 41 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:
                       1981:48015 CAPLUS
DOCUMENT NUMBER:
                         94:48015
TITLE:
                        Polyamic acids from diaminocarboxamides,
                        diamines, and tetracarboxylic dianhydrides
INVENTOR (S):
                       Makino, Daisuke; Suzuki, Hiroshi; Sato, Hidetaka
PATENT ASSIGNEE(S):
                      Hitachi Chemical Co., Ltd., Japan
SOURCE:
                        Ger. Offen., 18 pp.
                        CODEN: GWXXBX
```

DOCUMENT TYPE:

Patent

LANGUAGE:

German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	- <b></b> -			
DE 3012952	Al	19801023	DE 1980-3012952	19800402
DE 3012952	C2	19880922		
JP 55144027	A2	19801110	JP 1979-41482	19790404
JP 57005407	B4	19820130		

PRIORITY APPLN. INFO.: JP 1979-41482 19790404

Polyimide-polybenzoylenequinazolones with improved elec . properties are manufactured by cyclizing polyamic acids from tetracarboxylic dianhydrides, diamines, and 5-20 mol% (based on diamine content) diaminocarboxamide. Thus, a polyamic acid was prepared from 4,4'-diaminodiphenyl ether 0.0475, 4,4'-diaminodiphenyl ether 3-carboxamide (I) 0.0025, pyromellitic dianhydride 0.025, and 3,3',4,4'-benzophenonetetracarboxylic dianhydride 0.025 mol in N-methylpyrrolidone, cast onto a glass plate, and heated 1 h each at 100°, at 200°, and then at 350°, to give a 30  $\mu$  film with good phys. properties and dielec. strength (JIS K 2110) 306 V/ $\mu m$  at 400°, compared with 271 V/ $\mu m$  for a control prepared without I.

IT 72347-86-5P

RL: IMF (Industrial manufacture); PREP (Preparation) (manufacture of, with improved dielec. strength)

RN 72347-86-5 CAPLUS

CN Benzamide, 2-amino-5-(4-aminophenoxy)-, polymer with 1,4-benzenediamine, 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone and 5,5'-carbonylbis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

CRN 40763-98-2 CMF C13 H13 N3 O2

CM 2

CRN 2421-28-5 CMF C17 H6 O7

CRN 106-50-3 CMF C6 H8 N2

CM 4

CRN 89-32-7 CMF C10 H2 O6

IC C08G073-10; C08G073-06

CC 35-3 (Synthetic High Polymers)

ST dielec strength polyimide polybenzoylenequinazolone

IT Polyimides, preparation

(polybenzoylenequinazolone-, manufacture of, with

improved elec. properties)

IT 55478-71-2P 72347-86-5P

RL: IMF (Industrial manufacture); PREP (Preparation) (manufacture of, with improved dielec. strength)

L30 ANSWER 42 OF 42 CAPLUS COPYRIGHT 2004 ACS on STN ACCESSION NUMBER: 1980:181856 CAPLUS

DOCUMENT NUMBER:

92:181856

TITLE:

Comparative study of the photodegradation of

polybenzoxazoles and related model compounds.

Stabilization of polybenzoxazoles

AUTHOR (S): Despax, B.; Paillous, N.; Lattes, A.; Paillous, A.

CORPORATE SOURCE: Lab. Composes Azotes Polyfonctionnels, Univ. Paul

Sabatier, Toulouse, 31077, Fr.

SOURCE . Journal of Polymer Science, Polymer Chemistry Edition

(1980), 18(2), 593-609

CODEN: JPLCAT; ISSN: 0449-296X DOCUMENT TYPE:

Journal

LANGUAGE: English

Polybenzoxazoles containing adamantane rings were prepared from dihydroxybenzidine, 1,3-dimethyl-5,7-adamantanedicarboxylic acid chloride, 4,4'-(1,3-dimethyl-5,7-adamantanediyl)bis(benzoyl chloride), and 1,3-dimethyl-5,7-bis(3-amino-4-hydrophenyl)adamantane and their photochem. degradation was compared to that of monomer model compds. Formation of Ni complexes increased the solar irradiation stability and decreased their fluorescence. The effects of impurities and structural features were discussed in relation to the use of the polymers as transparent coatings

in spacecraft. 51728-50-8P 56764-79-5P 73539-22-7DP, cyclized IT 73546-52-8P 73546-54-0P 73546-56-2DP, cyclized RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and photochem. degradation of)

RN 51728-50-8 CAPLUS

CN Tricyclo[3.3.1.13,7]decane-1,3-dicarbonyl dichloride, 5,7-dimethyl-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA INDEX NAME)

CM

CRN 23117-30-8 CMF C14 H18 Cl2 O2

CM

CRN 2373-98-0 CMF C12 H12 N2 O2

RN 56764-79-5 CAPLUS

CN Poly[iminocarbonyl(5,7-dimethyltricyclo[3.3.1.13,7]decane-1,3diyl)carbonylimino(3,3'-dihydroxy[1,1'-biphenyl]-4,4'-diyl)] (9CI) (CA
INDEX NAME)

RN 73539-22-7 CAPLUS

RN 73546-52-8 CAPLUS

CN Benzoyl chloride, 4,4'-(5,7-dimethyltricyclo[3.3.1.13,7]decane-1,3diyl)bis-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA
INDEX NAME)

CM 1

CRN 73546-51-7 CMF C26 H26 C12 O2

CRN 2373-98-0 CMF C12 H12 N2 O2

RN 73546-54-0 CAPLUS CN Benzoyl chloride,

Benzoyl chloride, 4,4'-(5,7-dimethyltricyclo[3.3.1.13,7]decane-1,3-diyl)bis-, polymer with 4,4'-(5,7-dimethyltricyclo[3.3.1.13,7]decane-1,3-diyl)bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 73546-51-7 CMF C26 H26 C12 O2

CRN 71316-56-8 CMF C24 H30 N2 O2

73546-56-2 CAPLUS

CN Tricyclo[3.3.1.13,7]decane-1,3-dicarbonyl dichloride, 5,7-dimethyl-,
 polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diyl dibenzoate (9CI) (CA
 INDEX NAME)

CM 1

RN

CRN 73546-55-1 CMF C26 H20 N2 O4

CRN 23117-30-8 CMF C14 H18 C12 O2

CC 35-6 (Synthetic High Polymers)

ST polybenzoxazole polyadamantane photodegrdn; radiation stability polybenzoxazole polyadamantane; spacecraft coating polybenzoxazole polyadamantane

IT Space vehicles

(coatings for, polybenzoxazoles containing adamantane rings as transparent)

IT :

Fluorescence
(of polybenzoxazoles containing adamantane groups, nickel complexation effect on)

IT Polyamides, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(adamantane group-containing, photochem. degradation of)

IT Light-resistant materials

(coatings, polybenzoxazoles containing adamantane groups)

IT Polymer degradation

(photochem., of benzoxazoles and polybenzoxazoles containing adamantane groups, nickel complexation effect on)

IT Degradation

(photochem., of benzoxazoles, nickel effect on)

IT Fries rearrangement

(photochem., of biphenylyl diacetate adamantane derivative)

IT Photoelectric devices (solar, coating for, polybenzoxazoles containing adamantane rings

=>

as transparent)

- IT Coating materials
   (transparent, polybenzoxazoles containing adamantane rings, for
   spacecraft)
- IT 833-50-1 1724-54-5 52725-81-2 73535-97-4 73535-98-5 73545-86-5
  RL: RCT (Reactant); RACT (Reactant or reagent)
  (photochem. degradation of)
- IT 51728-50-8P 51728-75-7DP, nickel complexes 51728-75-7P 56764-79-5P 73539-22-7DP, cyclized 73539-23-8DP, nickel complexes 73539-23-8P 73539-24-9P 73546-52-8P 73546-54-0P 73546-56-2DP, cyclized RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation and photochem. degradation of)